IRON AGE

editorial

Russia Is Winning—So Far

WITHOUT hurting herself one iota, Russia has put the greatest nation in the world in a whirling state of confusion. Without apparently losing a single Russian, Stalin has forced a country that loves liberty and happiness to take on some of the trappings of a controlled state.

Of course there is a good reason for all this: We must be ready to defend the right to live and work and worship and think as free men. It is clear to even the most rugged isolationist that Russia is not out for fun. It is crystal clear to those who have followed her moves closely that she hopes to rule the world—by war if need be.

What has she done to us and to our allies? How much of the war—we are at war whether we want to say so or not—has she won? The answer is painfully clear. She has won so much that there are millions in this country who privately think we are doomed as a free nation.

We were sucked into Korea because our foreign policy was atrocious. Once we were in we had to support the United Nations: We sponsored U. N. as a possible hope for peace.

We are restricting, taxing and spending for war materiel. We must do this if we are to match Russia, lest she take everything for nothing. This will put us into a strait-jacket before we are through. It may give some of the fellow travelers a chance to keep us there for years to come.

Russia tries to drive a wedge between us and our allies by diabolical maneuvering. If we swallow this kind of stuff we are stupid. She has forced her satellite Red China to do her bidding and at the same time estranged us from people who should be our friends.

Her propaganda for communism has been so far superior to ours for democracy that some people think we really *are* aggressive-minded. Russia is a past master at deceit, lies and intrigue. Our sense of decency is an asset to her at every turn.

Russia still has a full bag of tricks—at the United Nations, in Asia, in Europe, in the United States. She will use them all to defeat us if she can.

We must control inflation. We must cut non-defense spending. We must not criticize our allies until we have all the facts. We must not let our defense effort lag nor let it wreck our economy. We must get rid of controls as soon as we can. We must have infinite faith in ourselves and we must elect leaders in whom we can have faith.

Tom Campbell

Editor

Basic Parts of America's Industrial Power...

The Production-Tested Legion of

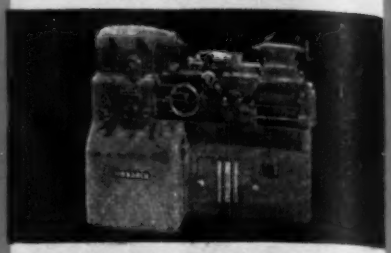
MONARCH PRECISION LATHES

Here's visible evidence that, whatever your turning problems, there's a specific Monarch Lathe to do the job. And, being a Monarch Lathe built to Monarch standards, you can count on peak production at minimum cost.

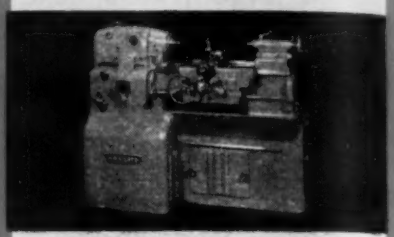
You won't see every Monarch Lathe on these pages —we couldn't get them all in. But note the variety. Note the *3* types of tracer controls—a choice that only Monarch offers. And please note this: regularly, since 1909, Monarch lathes have been first to feature almost every major lathe improvement later considered as standard for the industry. You're ahead of the field with Monarch—in longer life, in improved accuracy, in lowered costs.

For complete information—with performance data, photos and case histories—we have prepared specialized Bulletins. Just indicate your interest, and we'll send the ones you want. *The Monarch Machine Tool Company, Sidney, Ohio.*

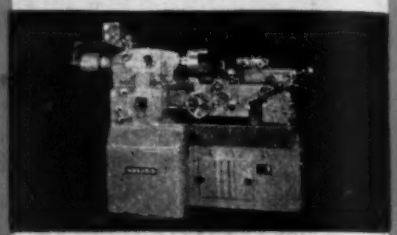
10" MACHINES



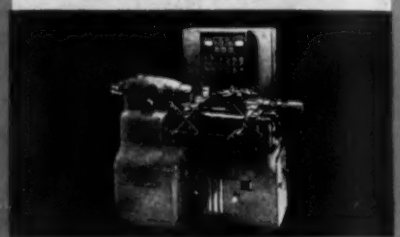
10" x 20" Model EE Toolmaker's Lathe



10" Precision Manufacturing Lathe



10" Precision Manufacturing Lathe with Turret



The Speedi-Matic

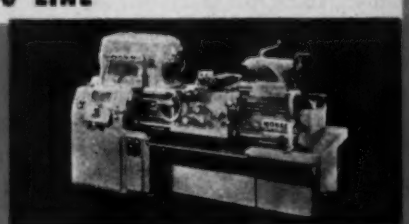
ROLL TURNING LATHES

Monarch Heavy Duty Roll Turner

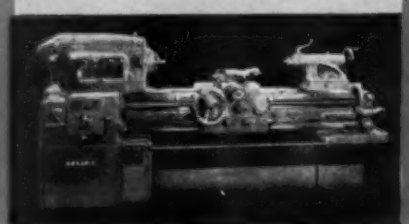
Model N Roll Turning machine

SERIES 60 LINE

12" Series 60 Toolmaker's Lathe



16" Series 60 Engine Lathe



20" Series 60 Toolmaker's Lathe

20" Series 60 Engine Lathe

IRON AGE *newsfront*

news methods and product forecast

► A great many large aircraft parts will eventually be made from huge forgings and extrusions but mass production along these lines is at least 2 years away. Thick skin magnesium construction may be an interim or supplementary step. The number of webs, stiffeners, rivets, etc., can be enormously reduced and production stepped up sharply if this technique proves itself—as tests made so far indicate it will.

► Another, and perhaps equally important aircraft development, is a cast magnesium wing section which has been produced for test purposes. Studies are now going on to work out a way to cast entire wings.

► A new nickel mine is now being developed in Canada. Prospects look good but nickel users should not get their hopes up too soon. It is not expected to be in production until 1954.

► Incandescent lamps with aluminum bases are being tested for consumer reaction. Mass production has been made possible by development of a suitable high-temperature aluminum sheet as well as the solder and flux to permit high speed automatic soldering.

► Steel castings can be made radiographically sound, the Naval Research Laboratory reports, without padding or chills, provided the distance from the perimeter of the riser to the edge of the plate is 4½ times the casting thickness.

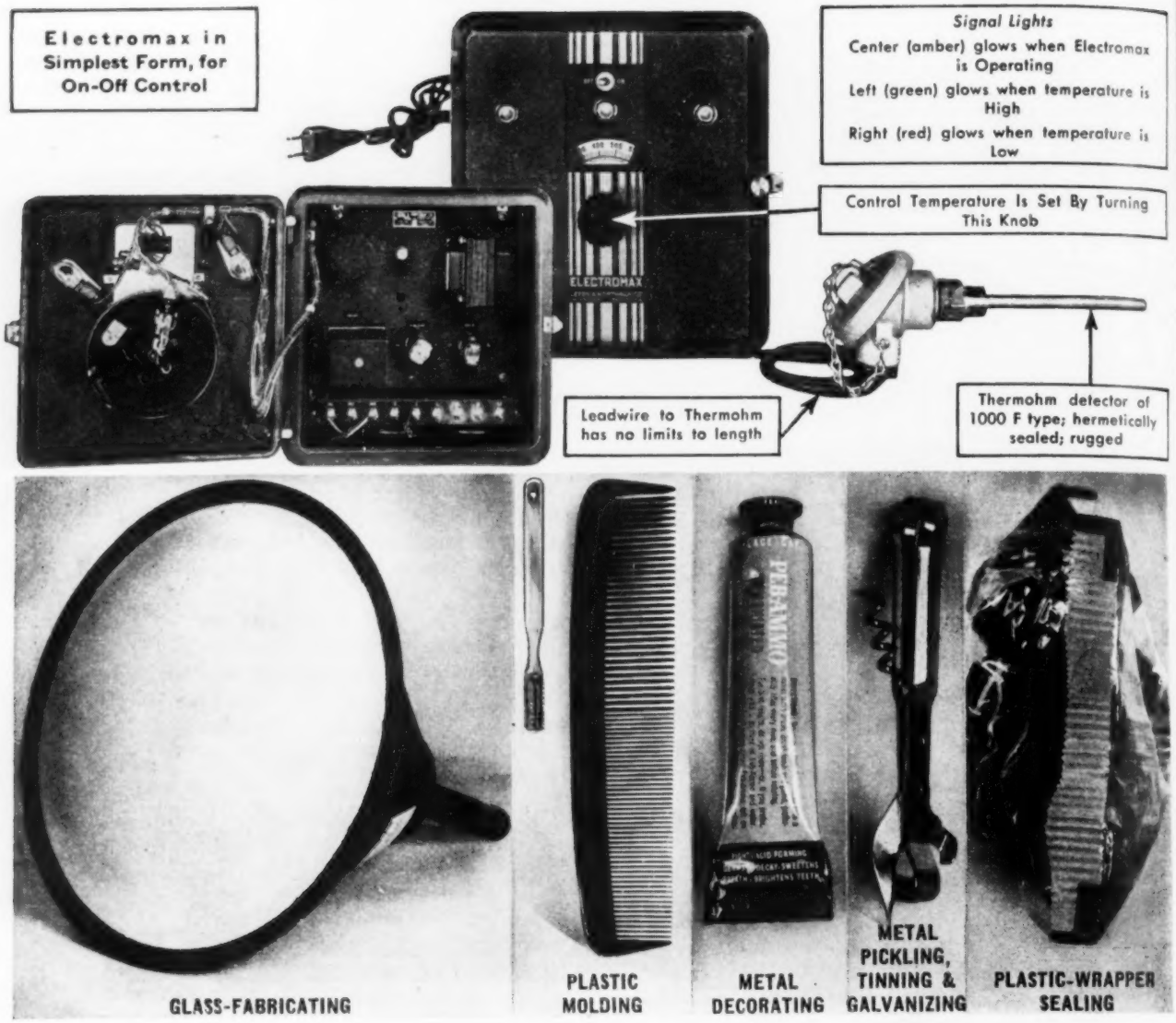
► An artificial fog strip along a section of the Autobahn near Frankfurt, Germany, guides drivers in bad weather. Laid along both edges of the concrete, the device throws up a wall of white fog about a foot thick, which headlights easily pick out. Operating costs are reported to be low though the installation is still too expensive to permit its use except at dangerous spots.

► The cost of crushing taconite to extremely fine powder can apparently be cut to about a third that of present methods, according to laboratory tests. The improved process also gives greater recovery of iron from the ore. A process for reducing these ores to metallic iron without prior sintering or pelletizing is now being evaluated.

► Some steel executives are beginning to wonder just what this country will do with all the steel once the current international situation clears up—one way or the other. But some long range guessers are optimistic—fearing to make the same mistake they made 10 years ago. They predict a boom period.

► Army Engineers have developed a 10,000-gal storage tank that can be set up in 10 minutes. It is made of a sandwich of Buna N synthetic rubber and nylon cloth with a nylon film lining. Though primarily intended for combat engineer work it might be used as a temporary fuel storage tank.

► Commercial production of columbium-bearing stainless steel from an all-scrap charge is growing in importance because of the columbium scarcity. The technique has already been referred to for foundry work; it is now being used in a steel mill.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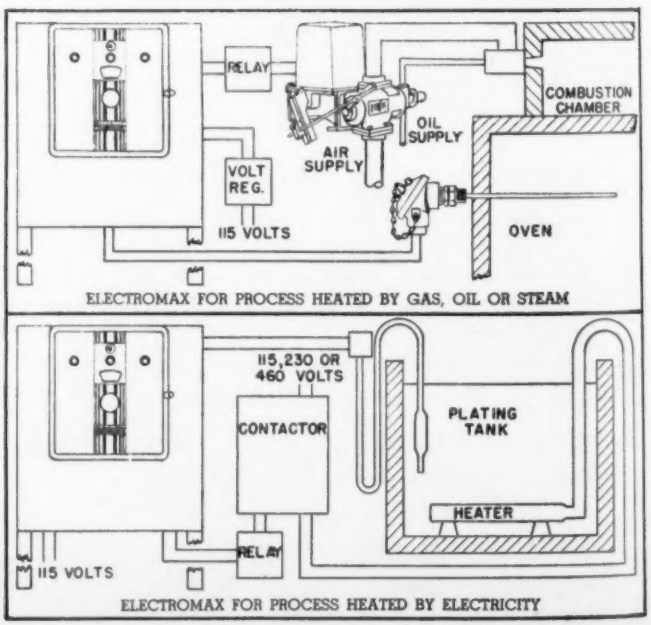

IRON AGE *summary*

iron and steel industry trends

Rail Strike Costs 100,000 Tons Steel
Cripples Shipments of Finished Steel
Regular Customers Face Quota Slashes

STEEL people will be struggling for many weeks to unsnarl the production and shipping mess caused by the rail tie up. Production schedules have been shattered; movement of vital raw materials has been blocked; and finished steel urgently needed by manufacturers has been frozen in the shipping yards.

So far more than 100,000 net tons of steel have been lost because of the wildcat strike. This production is lost forever. It can not be made up at a later date because the industry is straining its productive equipment almost to the breaking point to meet the double-barreled demand of military and civilian users.

Production Pulled Down from Behind

Steel production men who had been breaking output records week after week saw their operating rates pulled down from behind. This week the industry has tentatively scheduled steelmaking operations at 96.5 pct of rated capacity, down 4½ points from last week's revised rate.

Consumers hit quickest and hardest by the rail strike were those depending on current steel shipments to keep their operations going. Although every possible priority was given to shipments of defense (DO) orders, some of these were delayed too. Meanwhile, steel people engaged every available truck in an effort to deliver the growing stack of finished steel.

Lost production which had been slated for DO or essential civilian orders will have to be rescheduled at a later date. This means that other orders which had been already scheduled will have to be pushed aside. For the moment they will be deferred, but they may never be produced if programmed tonnage grows too big. At best the already critical production scheduling headache has been amplified and extended. It will take many weeks to work off—if possible.

King winter also blew freezing breath on output during the past week. In the Pittsburgh area the cold forced gas companies to curtail deliveries to numerous industrial plants. As a result at least three steel companies lost production.

Steel for Defense Snowballs

Meanwhile, the amount of steel going into defense and essential civilian programs is snowballing. Percentage of total output going into these directed uses varies among products and companies. There is widespread feeling among steel producers that they have almost reached the saturation point on plates, carbon bars, structurals and sheets. Some steel companies report as much as 50 to 70 pct of these products are currently being booked for directed programs.

One large company has already cut overall quotas of free steel to regular civilian customers 50 pct for March and April. Even this quota is tentative; it will be even more drastically slashed if more government orders or directives force them to again revise production schedules.

Government Smiles on Conversion

Steel conversion arrangements face no peril from government curtailment—at least for the present. Government officials obviously are influenced by the fact that total steel output now getting a healthy boost through the activity of resourceful converters. In one instance a government agency actually urged a steel consumer now getting steel as an essential user to augment its supply through conversion. The consumer shied away because of cost.

The long awaited rollback of scrap prices was expected to slow activity in the once explosive scrap market to a snail's pace. Buyers were ready to accept tonnage, but dealers and brokers wanted to feel their way along for at least a week or two until the new order could be fully digested.

(nonferrous summary, p. 134)

50% Increase in Production to Meet Demands for Brad Foote Gears

1951 may be rugged for all industrialists—including users of BRAD FOOTE gears —and the BRAD FOOTE GEAR WORKS. Already we're receiving from our friends heavy and urgent demands for early delivery.

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We thank our old friends. We welcome new ones. We are far better prepared than ever before with thoroughgoing engineering cooperation—with the finest gears we have ever built—with prompt delivery.

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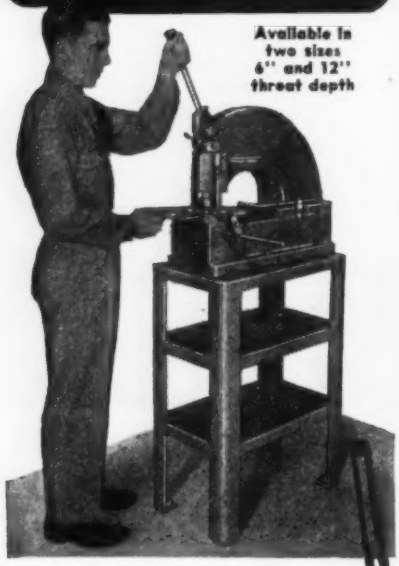

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Dear EDITOR

Letters from Readers

Trend to Local Mills?

Sir:

We are developing plans for the erection of a small steel mill here in Kansas City and were somewhat surprised to find that this subject had been covered in your Apr. 6, 1950 issue, of which we do not seem to have a copy. Would it be possible to obtain this issue or a reprint of the article relating to the small steel mill?

We are also interested in any information you may have relating to the approximate cost of setting up such a mill. We are primarily interested in equipment cost, since we plan to erect the equipment with our own organization.

R. V. SCHROEDER
Schroeder Steel Engineering Co.
Kansas City, Kan.

For the past two years we have been banging away on the possibility of such mills and trying to convince the industry of their practicability by publishing documented stories. The story on p. 79 of the Jan. 11 issue is again on a small steel mill for a local market and carries cost figures.—Ed.

Staunch Backer

Sir:

Thought you might be interested in a letter I sent to the Atomic Energy Commission regarding the DO-Priority symbols used by them:

I note with interest your letter to the Editor of THE IRON AGE, reproduced in the Dec. 28, 1950, issue, wherein you mention that the magazine was in error regarding certain DO symbols. You indicate that the Atomic Energy Commission uses DO Symbols 40-41-42-43-44, and are used to secure materials under contract for or by the A.E.C.

May I point out that THE IRON AGE was quoting from Dept. of Defense releases, particularly the release entitled: "DO Rating of Orders for Production Equipment." If the AEC is also issuing DO-ratings—and your letter states that this is so—then more than one firm must have just read about it in this excellent magazine. Our firm receives copies of regulations, directives, press releases, and other public information items, but nowhere has any of these AEC symbols appeared. . . .

It's hard to keep ahead of all the government BULL-etins. I try to do so—your staff does a much better job than I do—yet apparently we all ran out of official "dope." Just keep up the good job you are doing.

W. H. EVANS
Special Assistant
Hofmann Industries, Inc.
Sinking Spring, Pa.

Finally Remembered

Sir:

We have your issue of Jan. 11 and upon reading it, came across the editorial entitled "The Forgotten Man," written by your editor, Tom C. Campbell. We thoroughly agree with his sentiments and have had numerous copies printed and are sending them to our customers.

M. WILKOF
Morris Steel, Inc.
Canton, Ohio

Sir:

If there are any reprints to be had of your fine editorial in THE IRON AGE of Jan. 11, will appreciate 25 of same and being billed for them.

M. NEWBERGER
Summer & Co.
Buffalo

Classification Complexities

Sir:

Having been a reader of your publication for many years via the "route slip" system, I have found much useful information in its pages. One of the features frequently consulted is the table of finished steel shipments that appears monthly, and on this I would like some further information.

During 1950 the finished steel shipments of electrical sheet and strip have been reported in two classifications: "carbon" and "alloy." Does this reflect the AISI classification of alloy, and, if so, does the carbon classification cover the field and armature grades only? A further question concerns electrical grade. Presupposing this grade is not included in the carbon classification, is there any data available on shipments of the electrical grade?

F. J. MOYLAN
Product Representative
Inland Steel Co.
East Chicago, Ind.

The table is AISI 10, and all descriptive terms and definitions are those of the American Iron & Steel Institute. We are told by them that the field and armature grades are alloy, and that the carbon classification is used for intermittent pole lines. The Institute does not furnish us shipment data on the electrical grade.—Ed.

Seeks Directory

Sir:

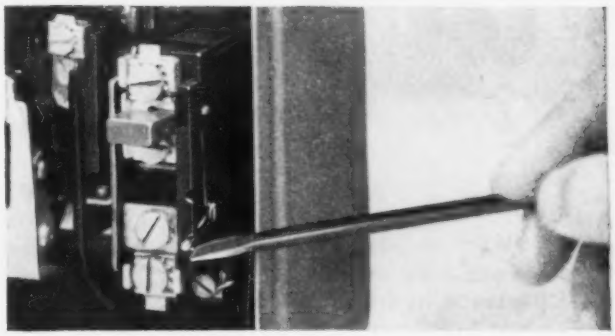
Will you please inform me where I might obtain a directory of structural fabricators, shipyards, and used machinery dealers, particularly those handling heavier plate working machinery?

J. L. HOLT
Consultant
Butler, Pa.

The directory most closely fitting this description is the "Directory of Iron & Steel Plants" published by Steel Publications, Inc., 4 Smithfield St., Pittsburgh 30. We do not know of any directory of used machinery dealers, although a membership list might be available from the Machinery Dealers National Assn., 20 N. Wacker Drive, Chicago. The Clearing House Section of THE IRON AGE sometimes carries offerings of machinery of this type.—Ed.

install for these 6 reasons

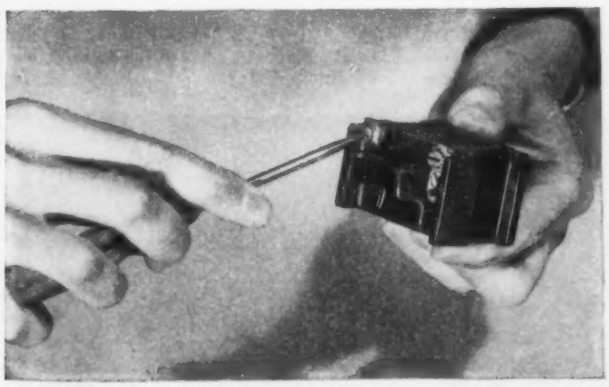
ABOUT THESE IMPORTANT FEATURES WITH THE "SCREWDRIVER TEST"



5 Mr. Perito: "*How do I set the overloads?*" Easy—and you don't have to take the starter apart to do it. Flip that little lever and it's on "Automatic." Flip it back and it's on "Manual." Heaters are in the front, can be changed without disturbing any wiring.

6 Mr. Perito: "*What about maintenance?*" Once this new G-E starter is installed, it *stays* installed. There's no need to remove the case for ordinary maintenance or even to replace or reverse contacts. Just remove the arc chute and there are your terminals.

3 Mr. Perito: "*Are all the terminals easy to get at?*" Every one of them is *up front* where it's easy to get at, and wire. And they're *big* terminals with panhead screws and saddle-type connectors that ride up with the screw head. The stripped wire simply slides into place and is easily secured with a turn of your screwdriver.



4 Mr. Perito: "*Tough-looking coil! Is it new?*" Right! It's called the "Strongbox Magnet Coil" and it's an exclusive with the new G-E starter line. Feel how solid it is! If your electrician's screwdriver slips, it can't hurt the windings—they're safely locked in a block of molded plastic. And oil, dust or water can't get at them, either!

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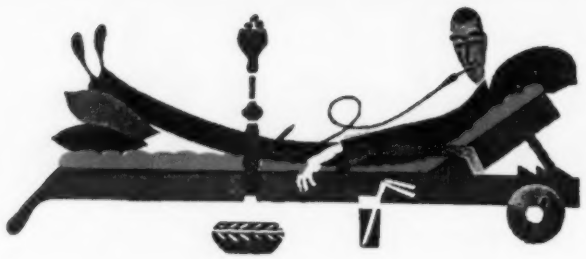

Fatigue Cracks

by Charles T. Post

Aptronyms

For a Friday dish, you can have Ruth R. Haddock, who writes publicity for the Xman Trout Ranch, fresh frozen trout packers in Nevada, or Paul R. Fish, recently named advertising director of *Hunting & Fishing* magazine.

Margaret's Friend

H. S. T. dropped over to the Washington Statler the other night to present his old friend Paul Wooten with the Silver Quill Award of the National Business Publications for outstanding service in behalf of business papers. Paul, as Washington member of the Chilton Editorial Board, keeps an eye on the cross-currents of government for your favorite family journal and its sister publications.

In presenting the trophy, the President said: "You never forget kind treatment when you move into a strange place. Just to show you the difference in the attitudes of people when a strange man comes to town, my daughter at that time was about ten years old—I hope you won't spread that around—and Paul Wooten lived in the apartment below us. And he was as kind to Margaret as anybody could be. And when anybody is kind to Margaret, I never forget it. And neither do I forget it when they are not."

Puzzlers

Still no answers to the ball problem in the January 28 issue. Our timing must have been off. Maybe we will repeat it in the spring when a young man's fancy turns to—among other things—baseball.

The great American mind once again conquers all obstacles. E. J. Sampson, Brockton, Mass., just happened to find on his bench a ball bearing with a radius of 0.46636 inches which he claims fits nicely between the 3 inch and 1 inch roller bearings in the 4 inch hole. This is close enough to the right answer of 0.461538461538 inches so we will add his name to the honor roll.

Here we go with another ladder problem from A. M. Woodall, The Ingalls Iron Works Co. A ladder is so placed in a street that the top of the ladder will just reach the top of a 40 foot high building on one side of the street or a 30 foot building on the other side, the included angle between the two ladder positions being 60°. What is the length of the ladder, street width and the location of the foot of the ladder?

machine tool high spots

sales inquiries and production

by W.A.Lloyd

Pool Orders in 10 Days—Big news for the machine tool industry is in the making this week, according to Washington sources.

First, release of the emergency production schedules (pool orders) is expected to start within 10 days. These orders will not be released on a mass basis, but probably in dribbles. It is understood that the orders will be released as soon as verification copies come back corrected from machine tool companies.

Thinking Reversed—Industry spokesmen predicted last week that pool orders would not be released until Apr. 1, or thereabouts. Apparently the thinking at that time was that a mass release would be made after verification had been received from all companies.

The change will accelerate the program considerably. However, some companies as of Feb. 1 had not received the copies for verification, which could easily push the release of their schedules back to Apr. 1.

General Purpose Order—Also in the wind is a general purpose order, which reportedly has been approved. It is believed similar but not identical to World War II's E-1-B, covering distribution of machine tools. Company order boards will probably be divided into two parts, 75 pct for the armed forces and 25 pct for foreign and essential civilian use. Mutual Defense Assistance Program orders will probably be consigned to this category, as was lend-lease in World War II.

Finally, priorities are expected to follow pool orders within days. The priority will not be of the blanket type but will enable machine tool companies to proceed with sub-contracting plans and materially increase their production.

Insurance for Industry — One function of the emergency production schedules will be as a sort of insurance policy for machine tool companies, in that they give a company authority to get a priority on material for increasing production and also, protect machine tool companies against the possibility of the bottom dropping out of the defense program if the Reds should suddenly extend an olive branch.

Demand Peak On Way—Coming up is a violent peak in machine tool demand which is expected to reach an estimated $1.3 billion in new orders this year and then begin tapering off gradually.

All defense orders will be rated. A general purpose order will, however, leave some big users of machine tools, including the automobile industry, dangling on some equipment, like special purpose machines which have not been started through the shops, etc. MDAP business will be assigned a new rating, DO-35.

Bands of Priorities—Also, it is understood that the Air Force is placing about $100 million of their projected $550 million program. These developments suggest that bands of priorities will probably be necessary to put first things first.

Recently the U. S. Navy placed orders for about $6 million worth of machine tools for its various bureaus. Still to come is an estimated $30 million under MDAP which will be split among France, Belgium and Holland. In addition, the present $125 million British program may be doubled.

Release Pool Machines—In Dayton, Ohio, Wright-Patterson Air Force Base, headquarters of the Air Materiel Command, announced that machine tools are being released from a 40,000-unit pool, collected after World War II, from private contractors and stored since 1946 in two depots, Bell Bomber plant, Marietta, Ga., and the former Martin Bomber plant in Omaha, Neb.

This Firefighter can be two places at once!

You can protect several danger spots at one time with a Kidde built-in carbon dioxide fire extinguishing system. ¶ Widely separated fire hazards...even on different floors can be protected by a single Kidde system. If fire strikes a protected space, directional valves rush fire-smothering carbon dioxide gas to the stricken area. The same CO_2 can set off mechanisms to shut doors and windows . . . turn off fans and machinery. After doing its job, the clean, dry CO_2 evaporates completely. ¶ Whatever your fire detection and protection problem may be, a Kidde expert will be glad to help. When you think of CO_2 call Kidde.

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Walter Kidde & Company, Inc., 250 Main Street, Belleville 9, N. J.
In Canada: Walter Kidde & Company of Canada, Ltd., Montreal, P.Q.

DATES *to remember*

Feb. 19-22—American Institute of Mining & Metallurgical Engineers, annual meeting, Jefferson Hotel, St. Louis. Institute headquarters are at 29 W. 39th St., New York.

Mar. 5-7—Hydraulic Institute, quarterly meeting, Santa Barbara Biltmore Hotel, Santa Barbara, Calif. Institute headquarters are at 122 E. 42nd St., New York.

Mar. 5-7—Manufacturers Standardization Society of the Valve and Fittings Industry, annual meeting, Commodore Hotel, New York. Society headquarters are at 420 Lexington Ave., New York.

Mar. 5-7—Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, William Penn Hotel, Pittsburgh. American Chemical Society national headquarters are at 1155 16th St., Washington.

Mar. 5-9—American Society for Testing Materials, spring meeting, Cincinnati. Society headquarters are at 1916 Race St., Philadelphia.

Mar. 6-8—Society of Automotive Engineers, passenger car, body and materials meetings, Hotel Book-Cadillac, Detroit. Society headquarters are at 29 W. 39th St., New York.

Mar. 12-15—National Electrical Manufacturers Assn., spring meeting, Edgewater Beach Hotel, Chicago. Association headquarters are at 155 E. 44th St., New York.

Mar. 13-15—Assn. of American Railroads, Engineering Div. and Construction & Maintenance Section, annual meeting, Palmer House, Chicago. Association headquarters are in the Transportation Bldg., Washington.

Mar. 13-16—National Assn. of Corrosion Engineers, conference and exhibition, Statler Hotel, New York. Association headquarters are in the Southern Standard Bldg., Houston.

Mar. 14-17—American Society of Tool Engineers, annual meeting, Hotel New Yorker, New York, Society headquarters are at 10700 Puritan Ave., Detroit.

Mar. 19-21—National Assn. of Waste Material Dealers, annual convention, Stevens Hotel, Chicago. Association headquarters are at 1109 Times Bldg., New York.

Mar. 19-21 — Steel Founders Society of America, annual meeting, Edgewater Beach Hotel, Chicago. Society headquarters are at 920 Midland Bldg., Cleveland.

Mar. 19-23—Western Metal Congress and Exposition, Civic Auditorium and Exposition Hall, Oakland, Calif. American Society for Metals headquarters are at 7301 Euclid Ave., Cleveland.

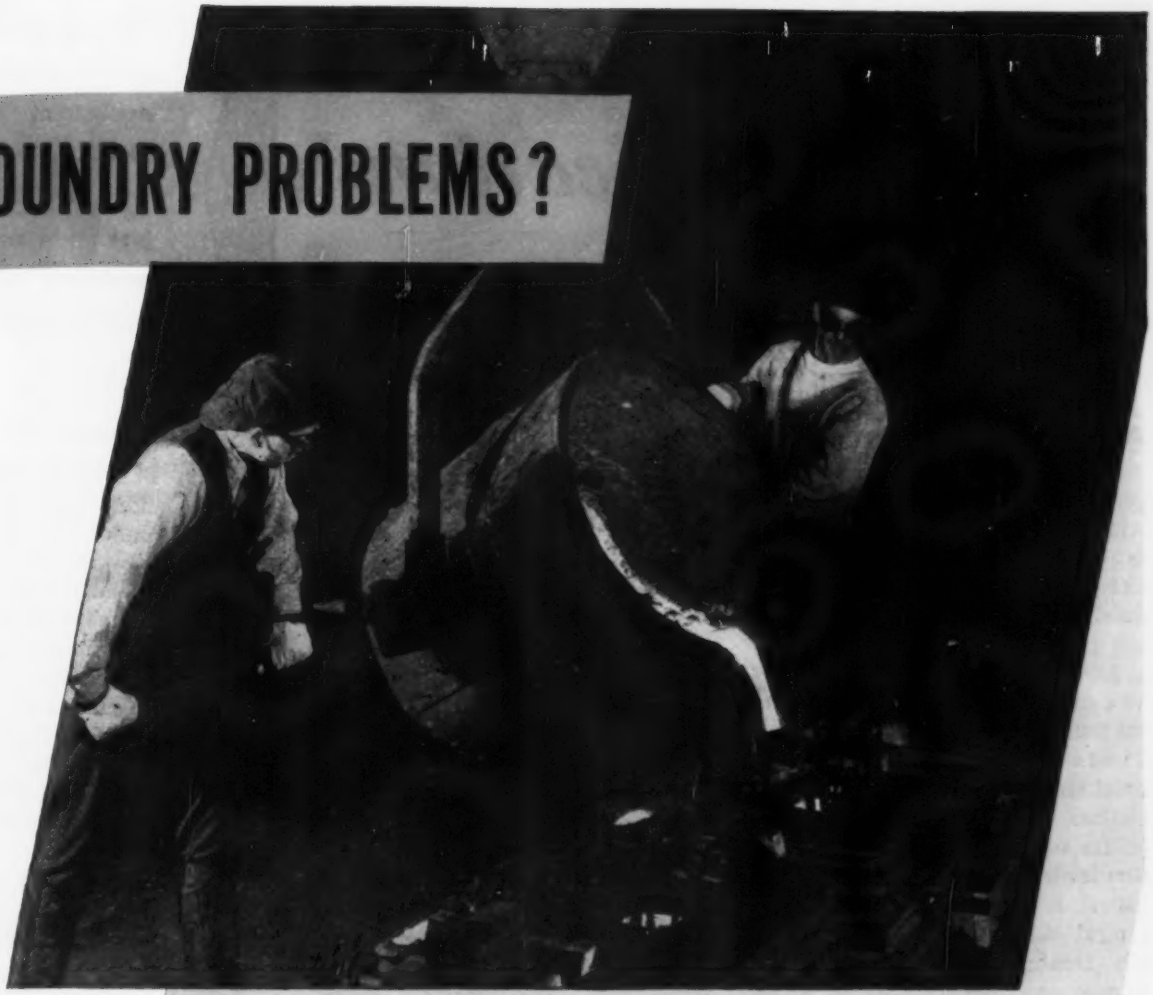
Mar. 22-23—Pressed Metal Institute, annual technical meeting, Hotel Carter, Cleveland. Institute headquarters are at 13210 Shaker Square, Cleveland.

Apr. 2-3—Diamond Core Drill Manufacturers Assn., annual meeting, The Homestead, Hot Springs, Va. Association headquarters are at 122 E. 42nd St., New York.

Apr. 2-4—American Institute of Mining & Metallurgical Engineers, openhearth and blast furnace, coke oven and raw materials conference, Statler Hotel, Cleveland. Institute headquarters are at 29 W. 39th St., New York.

Apr. 2-5—American Society of Mechanical Engineers, spring meeting, Atlanta Biltmore Hotel, Atlanta. Society headquarters are at 29 W. 39th St., New York.

FOUNDRY PROBLEMS?



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He's the Republic Pig Iron Metallurgist, a practical foundryman with years of actual foundry experience. He's an expert at solving foundry problems, because he knows irons, how they behave, and how to make them behave.

Often, a single phone call is all that's needed for him to spot the cause and furnish the solution to a troublesome problem. Or perhaps it will be necessary for him to pay your foundry a visit. In either case, you can be sure that he will respect your confidence, without reservation.

Republic—producer of America's leading pig irons—offers you the services of the Pig Iron Metallurgist without cost or obligation in any form. Write, wire or phone, for prompt help with any foundry problem!

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Al Finishing Manual

The 1950 edition of the 124-p. process manual, "Finishes For Aluminum," is a revision supplying basic information on the various processes for applying surface finishes to aluminum; it also details the characteristics of the finishes produced. Information is given on 10 cleaning treatments, 15 mechanical finishes, 16 chemically produced finishes, 11 electrolytic oxide finishes, organic finishes, and specialized finishes such as luminous paints and vitreous enamels. A section is also included on controls and tests. A guide for approximating typical costs of applying 20 different treatments to aluminum is shown. Another new table gives typical finishing practices for a wide variety of aluminum products to serve as a suggestion when selecting a finish. *Reynolds Metals Co. Address requests to this column on company letterhead.*

Bearing Maintenance

A continuing study of bearing maintenance techniques and successful maintenance, installation and removal procedures is being published, in pamphlet form, on every type of bearing. A file folder type of binder is being sent to each bearing user who requests it in which succeeding issues can be compiled. At the present time too many bearings are being replaced for reasons other than normal fatigue, which in most cases is due to faulty maintenance practice. Proper distribution and use of the material to be published is intended to reduce this loss to a reasonable minimum. *Anti-Friction Bearing Distributors Assn. Address requests on company letterhead to this column.*

Contour Projector Booklet

What the Kodak Contour Projector Model 2 is—and how it can be used to magnify dimensions, shapes, and surfaces in production or tool making—is the subject of a new 8-p. descriptive booklet. Pointing out that the projector is a potent weapon against rising inspection costs, the booklet describes both the features and application of the machine. Some of the special jobs that the projector can do include, as shown in the booklet, looking into deep recesses, exploring and measuring sizable concavities in one continuous operation at high magnification, and checking intricate dimensional relationships. Specifications, optics, and accessories are described in detail. *Industrial Optical Sales Div., Eastman Kodak Co.*

For free copy insert No. 1 on postcard.

Fork Truck Info

Data in a new 8-p. descriptive bulletin translates into user benefits the design and construction features of the new Baker FT fork trucks in 3000 and 4000 lb capacity. The bulletin contains pictures and descriptions of major components of the trucks, dimension drawings showing maneuverability and detailed specifications. Features that assure ease of handling and maintenance are described, and pictures showing the trucks working in various industries and 16 different applications are included. The bulletin contains illustrations of 14 of the many attachments which can be applied to the trucks for the handling of material in sizes, shapes and forms not practical with standard forks. *Baker Industrial Truck Div., Baker-Raulang Co.*

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Core Binder

The use of Totanin in all branches of the foundry industry as a core binder, a binder for dry sand mixtures, and for mold washes is described in a new 8-p. booklet discussing the many advantages of this water soluble powder. Several typical mixtures for both general and special purposes are shown, and this British company offers free technical advice on any specific problems not covered in the booklet. *Lambeth & Co. (Liverpool) Ltd.*

For free copy insert No. 3 on postcard.

Book on Refractories

"Modern Refractory Practice" is a practical 440-p. engineering handbook, a comprehensive technical treatise, and a catalog of Harbison-Walker products, combined in a single volume. The new edition has been completely rewritten and increased in size. Scale drawings of 20 types of furnaces, illustrating up-to-date industrial practice, constitute one of the most important features. The drawings show in detail not only the design of the furnaces, but also the types of refractories generally used, and alternate types for special conditions of operation. The discussion of service conditions and requirements for refractories in furnaces of a wide variety should prove helpful to furnace operators. A chapter is devoted to suggestions of a practical nature regarding the selection, care and use of refractories, including handling, installation and service factors which affect the life of refractories. Properties of refractories are fully covered, and another chapter contains a discussion

Turn to Page 122

NEW *production ideas*

new and improved production ideas, equipment, services and methods described here offer production economies . . . fill in and mail postcard.

Coating Service

For protecting metal or wood parts against corrosion or abrasion.

Application of natural or synthetic coatings for metal or wood equipment and products to provide protection against corrosion or abrasion is offered as a new service. Equipment so bonded is said to last longer, reduces plant shut-down and decreases maintenance costs. Coatings, either dipped or sprayed, may be applied to any type equipment, inside or out, regardless of size, shape, use or quantity. All work is done at the plant of the *American Rubberizing Co.*

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Micrometer

Interchangeable anvils give one micrometer a range of 6 to 12 in.

Six anvils are furnished with the micrometer, all readily interchangeable and providing the full range in steps of 1 in. Each anvil is marked to show capacity and is fitted with an adjusting collar that compensates for wear and acts as a seat when clamped in position by a locking collar. Suitable wrenches are furnished to make necessary adjustments. The complete set is packed in a durable wood case. *L. S. Starrett Co.*

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Carbide Boring Tools

Standard type to fit each of the more popular boring machines.

A new solid carbide boring tool is available from stock in all the carbide grades listed in Super's new Catalog 50 and can be produced in other suitable grades upon request. The company now offers a total of nine types of standard carbide boring tools. *Super Tool Co.*

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Improved 4-Ton Punch Press

8-in. open height permits the use of higher dies and special tooling.

The improved 4-ton deep throat press punches to the center of an 18-in. circle. Frame construction has been strengthened at all stress points and a knock-out has been added. With the exception of the frame, trip link and legs, all parts have been standardized and are interchangeable with the regular 4-ton model, expediting shipment of replacements. *Benchmaster Mfg. Co.*

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Low Cost Iridites

Two chromate finishes for bright finishing of zinc plated surfaces.

Iridite No. 8P is sold in powder form, providing the advantages of lower freight rates, easier handling and elimination of the use of carboys. It is extremely flexible and economical in use. Cost per gallon of working solution ranges from 8¼¢, when operating in the yellow color ranges, to 35¢ per gal when operating in the blue-bright ranges. Iridite No. 12 is a chromate treatment for bright zinc plate that both passivates and imparts a chrome-

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inate need for bearing races and they provide the most compact high-capacity anti-friction bearing possible. They require no more space than so-called plain or "solid bearings." • Tell us what sizes and quantities you might use. It pays to "contact KAYDON of Muskegon."

KAYDON Types of Standard or Special Bearings: Spherical Roller • Taper Roller Ball Radial • Ball Thrust • Roller Radial • Roller Thrust • BI-ANGULAR Roller

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production ideas

Continued

like appearance to the slated surface. Since it provides relatively little chemical polishing action for the zinc, it should be applied only to bright zinc deposits. It is shipped in carboys in concentrated form. Both products are applied by chemical dip method using standard finishing shop equipment. *Allied Research Products, Inc.*

For more data insert No. 17 on postcard.

Spot Welding Control Units

For low-capacity, spot-type resistance welding machines.

New synchronous and nonsynchronous control equipment uses air-cooled thyratron tubes to make and break the welding current. There are no moving parts. All components are mounted on a side-swinging panel, enclosed in a NEMA type I enclosure for ease of inspection and maintenance. Units can be mounted on or near the welding machine. Rms current ratings range up to 50 amp at a 10 pct duty cycle for synchronous units; up to 100 amp at 10 pct duty cycle for the nonsynchronous. *Westinghouse Electric Corp.*

For more data insert No. 18 on postcard.

Inductrol Power Packs

A convenient unit for low-voltage, regulated ac lighting, power supply.

Called an Inductrol Power Pack, a new midget load center unit substation incorporates in one steel housing an air circuit breaker, a dry-type transformer and an air-cooled induction regulator. Available in single or three-phase ratings, it has a capacity range of 15 to 100 kva, with incoming circuit rated 480 or 600 v, 60 cycles and a regulated output at 120/240 or 208Y/120 v. Units can be used also to regulate power supplied to resistance heating and infrared heating equipment, electronic apparatus, precision instruments and control circuits. *General Electric Co.*

For more data insert No. 19 on postcard.

Plate-Edge Preparation

Device cuts single or double bevel accurately, with or without a land

Employing a spring-balanced free floating carriage and caster-wheel assembly to permit bevel cutting over plate undulations while maintaining a constant tip-to-work distance, a new plate edge preparation device may be mounted on any gas cutting machine equipped with a 3-in. square torch bar. Torches may be individually positioned vertically or laterally without changing the bevel angle. Ability of the device to cut a single or double bevel accurately, with or without a land, recommends it especially for use in shops or factories that do steel fabrication work. *Air Reduction Sales Co.*

For more data insert No. 20 on postcard.

Fire Detection System

Sees fire, does not depend on heat, smoke or other indications of fire.

Fireye fire detector provides instantaneous detection of fire. Based on the photo-electric principle, it is capable of detecting a very small fire, yet ignores extraneous light of any intensity. The protection block consisting of six detectors and one control panel provides coverage up to 120 by 80 ft. Each detector monitors any area within a radius of 20 ft. Connections can be made to a wide variety of existing alarm and automatic extinguishing systems. *Fireye Corp.*

For more data insert No. 21 on postcard.

Scrap Separator

Processes nonferrous chips and fine borings with less than 10 pct iron.

For the automatic separation of magnetic and non-magnetic products, a non-electric permanent Alnico double drum magnetic separator has been developed. The separator incorporates two magnetic Perma-Drums, one mounted directly above the other, enclosed in a dust-tight housing. Non-magnetic material flows over the drum shell in a normal trajectory. Magnetics are held fast to the surface of the shell for one half revolution until they are carried to a point beyond the magnetic field, to be separately discharged. As the material is spouted from the first to the second drum, it is turned over, so that a more effective secondary separation

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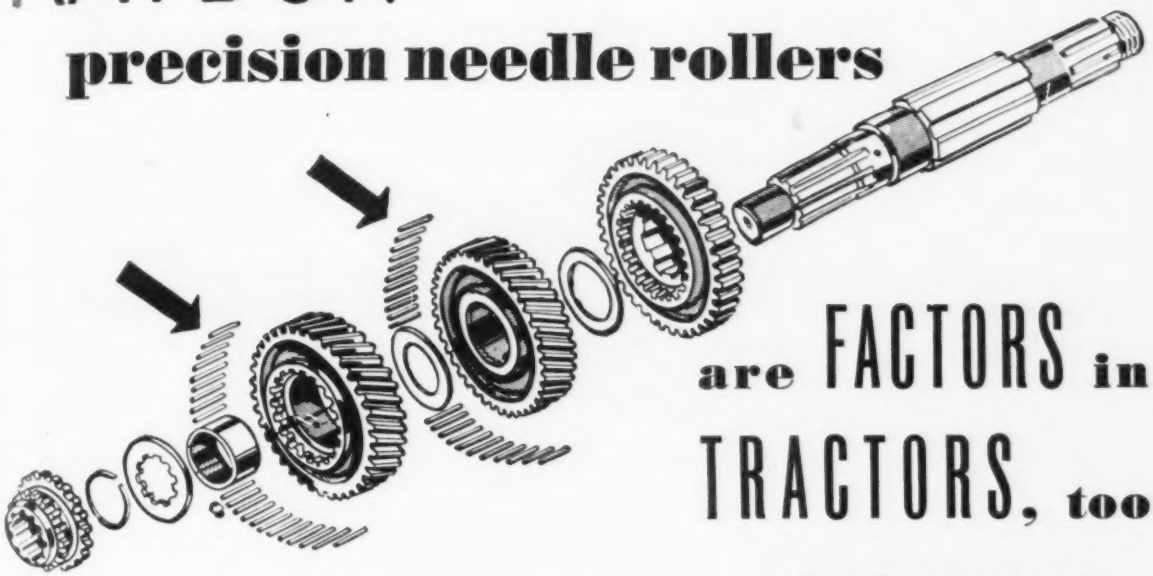
KAYDON

precision needle rollers



are FACTORS in TRACTORS, too

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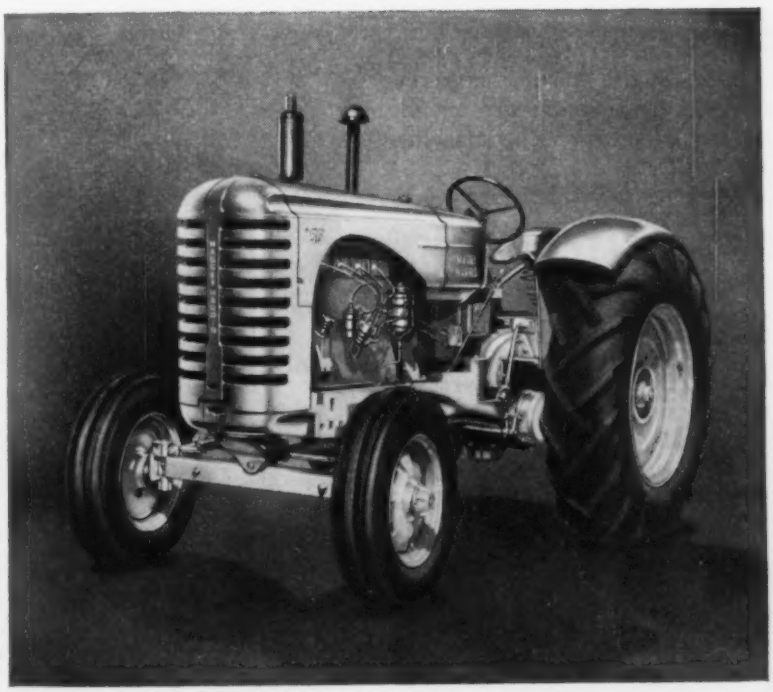
THE TRACTOR ENGINEERED TO MAKE FARMERS SAY:

"Make it a Massey-Harris"



Now Massey-Harris engineers have adopted KAYDON Precision Needle Rollers for the transmission gears of their Model 55 Tractors. Here, as in many other automotive transmissions, universal joints, clutches, steering gears and various precision assemblies in all types of machinery . . . these dependable, economical precision needle rollers are "making good."

Billions of them are being made in standard sizes, 1/16" to 5/16" diameters (tolerance .0002" on diameter), flat or rounded ends. You get the benefit of low cost for highest performance-proved quality, in small or large quantities.

Used between hardened shafts and hardened bores of housings or gears, they eliminate need for bearing races and they provide the most compact high-capacity anti-friction bearing possible. They require no more space than so-called plain or "solid bearings." • Tell us what sizes and quantities you might use. It pays to "contact KAYDON of Muskegon."

KAYDON Types of Standard or Special Bearings: Spherical Roller • Taper Roller Ball Radial • Ball Thrust • Roller Radial • Roller Thrust • BI-ANGULAR Roller

THE KAYDON ENGINEERING CORP., MUSKEGON, MICH.

• ALL TYPES OF BALL AND ROLLER BEARINGS 4" BORE TO 120" OUTSIDE DIAMETER •

production ideas

Continued

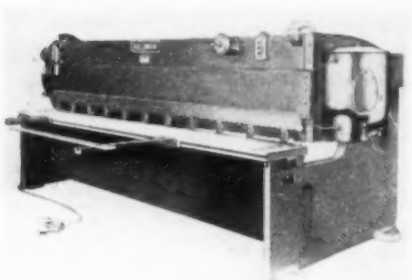
takes place. Nine different size units cover most applications. Magnetic permanence of the magnets are guaranteed to last the life of the installation. *Dings Magnetic Separator Co.*

For more data insert No. 22 on postcard, p. 35.

Power Squaring Shears

New series adopts construction variations from the basic design.

A complete range of sizes in the new power squaring shear line has capacities of 3/16 in. to 12 ft, ¼ in. to 14 ft, ⅜ in. to 20 ft, ½ in. and ¾ in. to 14 ft, 1 in. to 12 ft, and 1¼ in. x 6 ft. The smaller units are all-welded rolled steel construction, using the heavy steel plate work chute as a structural member. Models ¼ in. x 14 ft and larger are assembled rolled steel construction with structural members dovetailed into each other and bolted. All members have been designed to give the assembly a safe measure of strength and rigidity without excess weight. An air-operated disk



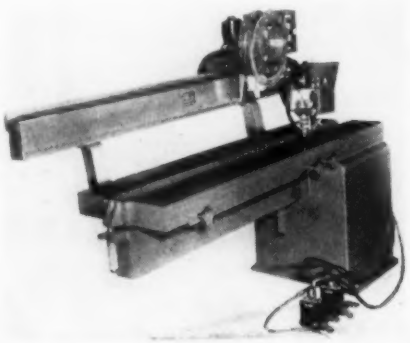
clutch has been installed in the flywheel, controlled by a solenoid through a jog or foot switch. Full cutting capacity is obtained with 80 lb air pressure. A spring-operated disk brake automatically stops the shear in event of air or power failure. Positive, automatic hydraulic hold-downs are standard on all except 3/16-in. units. All models can be equipped with 10-ft range squaring arm with steel scale and hinged gage and stop, 50-in. range front gage, light-gage for scribe line shearing and motorized front-operated micrometer back gage. *Columbia Machinery & Engineering Corp.*

For more data insert No. 23 on postcard, p. 35.

Hidden Arc Seam Welder

Seam welder automatically welds seams in 14 gage to ¼ in. metal.

This universal horn type welding machine uses a Lincolnweld head and carriage for automatic hidden arc welding. Designed for welding cylinders or other hollow shapes, it also can splice sheets and through-weld flanges in making containers. Work up to 18 ft long can be handled and the machine can be extended to take longer pieces. Minimum diameter is 12 in. Work is placed over the rigid box section horn and the two edges of the seam to be welded are gripped by pneu-



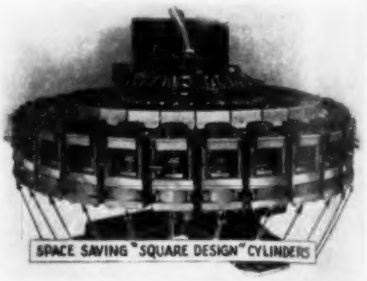
matically operated heavy copper fingers. Back-up for the weld is provided by a patented back-up device. Automatic brazing or inert-gas-shielded arc welding on stainless steel and nonferrous metals also can be done on the machine. *Lincoln Electric Co.*

For more data insert No. 24 on postcard, p. 35.

Space-Saving Cylinders

Compactness of 30-station welding machine due to square cylinders.

Designed by Hautau Engineering Co. of Detroit, for volume production of automotive transmission brake bands, a new special 30-station Cyclewelding machine is said to owe its economical compactness of design largely to the use of space-saving square-design cylinders. The machine makes maximum use of standard parts for easy replacement. Each of the 30 stations is an independent press with its own, replaceable standard thermostatic controls, electrical connections and square-design cylinders. The 30 stations are built into a compact 9½-ft diam circular table, allowing convenient accessibility to center slip rings and air headers from a standing position. It is stated the use of circular cylinders of the same bore would require an 18-ft diam table. Cylinders have solid steel heads, caps and mount-



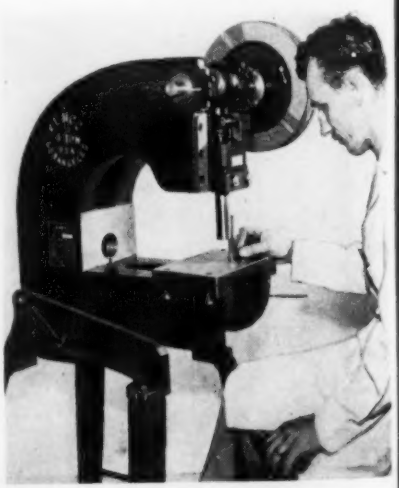
ings, scratch-resistant, hard chrome plated piston rods, dirt wiper seals, rustproof brass barrels, and self-regulating, wear-compensating seals. *Miller Motor Co.*

For more data insert No. 25 on postcard, p. 35.

Punch Press

Changes from single to continuous ramming without stopping the press.

A new 4-in-1 four-ton punch press has a deep, 12¾-in. throat, a 400-lb cast frame and patented clutch drive dog built into the clutch collar instead of a slot in the crankshaft.

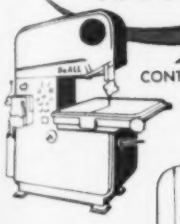


This was engineered to eliminate weakening the one-piece shaft by deep milling. A special trip mechanism permits the operator to change from single to continuous ramming without stopping the press. An adjustable bed permits quick conversion from the standard press to long punch, half or horn press. Connecting rod bearings are of steel encircled bronze-lead alloy.

Turn to Page 127

DoALL

INDUSTRY'S NEW SET OF TOOLS



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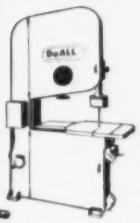

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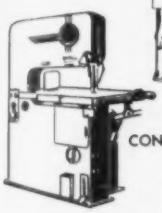

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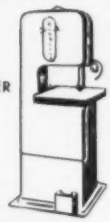
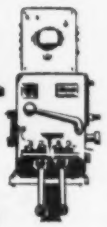


BAND FILER

TOOLROOM GRINDER

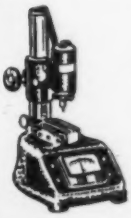
CRUSH GRINDER

"COOL GRINDING" ATTACHMENT



BLADE WELDER

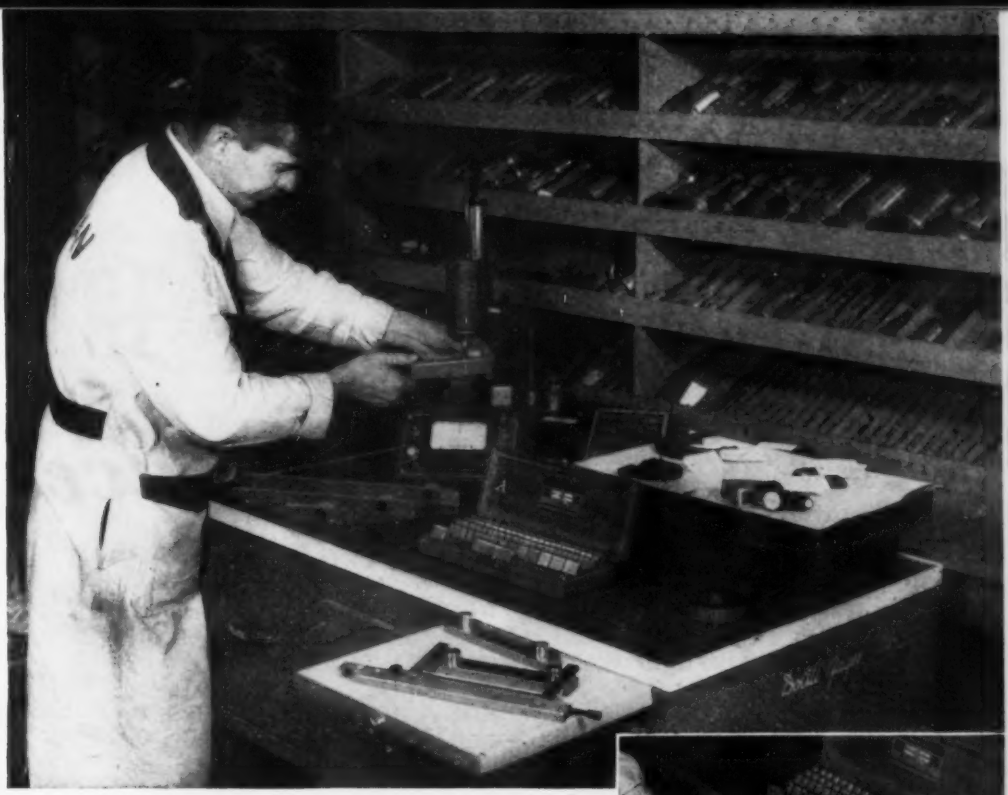
GAGE BLOCKS



GAGE ACCESSORIES

VARIABLE SPEED DRIVES

SAW BANDS



IT'S IMPOSSIBLE to have GOOD INSPECTION without GAGE BLOCKS

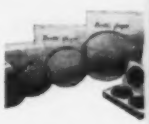
DoALL MOBILE INSPECTION UI contains a completely integra set of Precision Inspection Too

Your Plug Gages, Ring Gages, Snap Gages, Dial Indicators, Comparators, Micrometers, and other shop measuring tools cannot measure accurately unless they are used with, and regularly checked against, a reliable set of Precision Gage Blocks.

The only way Gage Blocks are an expense is when you don't have them to use. Without them, you lose more than many times their cost in rejects, material and labor.

DoALL Gage Blocks and Accessories are the best in the world today. Our Gage Specialists can prove it to you. Write for proof today.

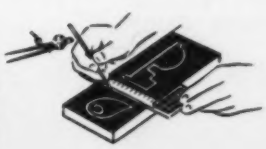
Gage Block Holders



Optical Flat

Comparators

Dial Indicators



TOOL STEEL

BENCH FILER

The DoALL Company

Des Plaines, Ill., U.S.A.

Cable Address: DoALL, Des Plaines

DoAll Stores in Key Cities

Factory Trained Representatives Everywhere

IRON AGE *introduces*

E. M. Heinmiller, elected president to succeed **A. J. McAllister,** who has retired from the FAIRFIELD MFG. CO., Lafayette, Ind.

Robert F. Rentschler, named vice-president assigned to special duties; **James M. Heppenstall,** appointed treasurer and **Lester E. Leinbach** appointed secretary of the BIRDSBORO STEEL FOUNDRY & MACHINE CO., Birdsboro, Pa.

Paul A. Duke, named product engineer for ATLANTIC STEEL CO., Atlanta.

Oscar L. Olson, appointed president and general manager of SWEDISH CRUCIBLE STEEL CO., Detroit.

Arthur Peacock, named assistant secretary-treasurer and comptroller of BORG-WARNER INTERNATIONAL CORP., Chicago.

J. L. Hiers, named assistant general manager, Woodhouse Chain Works, ROUND ASSOCIATE CHAIN CO., Trenton, N. J.

Robert Krogh, named in charge of sales in the Cincinnati area, for the ISPEN INDUSTRIES, INC.

Paul Abel, elected vice-president in charge of engineering for the YODER CO., Cleveland.

Philip D. Moore, appointed manager of employee and community relations of CARBOLOY CO., INC., Detroit.

L. G. Graper, named technical advisor for the LONE STAR STEEL CO., Dallas.

Douglas E. Thompson, appointed manager of by-products sales of the BUDD CO., Philadelphia.

William G. Gerstacker, named chief engineer of the COLONIAL IRON WORKS CO., Cleveland.

Herbert L. Mausk, elected vice-president sales, railway division, and **Ellsworth H. Sherwood,** elected assistant vice-president sales, railway division of the NATIONAL MALLEABLE & STEEL CASTINGS CO., New York.

Eric Springer, named general manager El Segundo division; **Fred Herman,** named general manager Long Beach division and **Leo Carter** for the Santa Monica division of DOUGLAS AIRCRAFT CO. **Harry Woodhead,** named general manager of the Tulsa, Okla., division.

Walter L. Davidson, named sales manager, heating department of DRAVO CORP., Pittsburgh.

John A. McKinley, promoted to the position of pigment sales supervisor for METALS DISINTEGRATING CO., INC., Elizabeth, N. J. **John P. Halloran,** appointed manager of the company's Chicago office.

E. B. Forslund, appointed manager of the New York Sales office of the MERCURY MFG. CO., replacing **Conrad Hibbeler,** who has retired.

Peyton S. Hopkins, named to manage the Washington, D. C., office of the RUST ENGINEERING CO., succeeding **Richard E. Butler,** who is retiring after 20 years with the company.

J. M. East, appointed vice-president and general manager of the KING & KRINGEL MACHINERY CORP., Denver.

E. C. Iverson, appointed chief engineer of the TOWMOTOR CORP., Cleveland.

Turn to page 70

ALEX G. McKENNA, named executive vice-president of Kennametal Inc., Latrobe, Pa.

ROBERT H. OWENS, named president and general manager of Roots-Connersville Blower Corp., Connersville, Ind.

H. W. FAGERT, elected president, general manager and board member of the R. D. Fageol Co., Detroit.

IRON AGE

salutes

John L. Neudoerfer

JOHN L. NEUDOERFER, new president of Wheeling Steel Corp., is impressive without seeming or wanting to be. A visit with Mr. Neudoerfer is like sitting down for a chat with an old family friend. He wears the presidency of Wheeling like a comfortable old felt hat.

He's an old-timer in the steel business, one who came up through the ranks. But he is not inclined to belabor this point, however proud he must be of it. He rarely becomes sufficiently disturbed to raise his voice above a normal conversational level. People who work for him love him for it.

When John Neudoerfer was a boy in Portsmouth, O., his father wanted him to become an electrical engineer. Had it been any other town, maybe that is the way it would have been. But in Portsmouth the steel industry made too great an impression on the youngster. So at 20 he took a job as clerk in the order entry department of a company that later became part of Wheeling Steel. That was it.

Later, Mr. Neudoerfer took to the road as a steel peddler. He knows what it's like to sell steel when the going is tough, too. In fact, he was elected vice-president in charge of sales in 1931—a year that a lot of people would like to forget—and is still waiting for the "normal" year that is always just around the corner.

John Neudoerfer has a large capacity for hard work, but quietly. This side of his personality is wearing off on his associates, with the result that steel is made and sold at Wheeling without abnormal rises in blood pressures.

Somehow you get the impression that the Wheeling ship is in good hands—that a good, safe course is being charted for the years ahead.

W. W. WARNER, elected vice-president in charge of engineering of the Davey Compressor Co., Kent, Ohio.

K. C. GARDNER, JR., vice-president in charge of operations for United Engineering & Foundry Co., Pittsburgh, was elected a member of the board of directors and executive committee.

CYRIL J. BINNE, appointed to the position of works manager of the Morris Machine Tool Co., Cincinnati.

R. SMITH SCHENK, appointed executive vice-president of Sun Tube Corp., Hillside, N. J.

IRON AGE *introduces*

Continued

Harold R. Foss, named assistant director of the office of defense products, FORD MOTOR CO., Dearborn, Mich. Other appointees: **Donald C. Pippel, John S. French, Kenneth D. Holloway** and **W. E. Simms** were appointed as contract administrators.

Dean, Hammond, appointed vice-president in charge of engineering of KAISER-FRAZER CORP., Willow Run, Mich. **S. W. Taylor,** appointed to the newly created post of executive engineer.

Robert M. Critchfield, named assistant general manager, Allison Div., in Indianapolis for GENERAL MOTORS CORP.

John P. McLaney, Webster C. English, named to general machinery division offices in the south by ALLIS-CHALMERS MFG. CO., Charlotte, N. C., and **Andrew J. Beall, Jr.,** named to the New Orleans office.

Charles W. Pinkerton, named office supervisor of the Coatesville District sales office of LUKENS STEEL CO. Mr. Pinkerton replaces **John W. Martin** who has been recalled to active duty with the Air Force.

Robert L. Pettibone, appointed chief metallurgical engineer of the SINTERCAST CORP. OF AMERICA, Yonkers, N. Y.

Arthur T. Baum, Jr., elected personnel director HYDRAULIC EQUIPMENT CO., Cleveland.

Charles H. Merbitz, appointed sales representative of the type metal department of Federated Metals Div., AMERICAN SMELTER & REFINING CO., Philadelphia.

Edwin H. Howell, appointed special representative for the GENERAL ELECTRIC CO., in Washington, D. C. **Donald E. Craig,** named to succeed Mr. Howell as manager of sales of the meter and instrument divisions, with headquarters in Lynn, Mass.

Frederic W. Thomas, appointed director of purchases, and **George R. Fox** becomes assistant to the executive vice-president in charge of the plant expansion program, of the JOY MFG. CO., Pittsburgh.

R. Bruce Vasey, joined DAVID ROUND & SON, Cleveland, in the capacity of sales promotion manager.

A. L. Geisinger, appointed a vice-president by DIAMOND ALKALI CO., Cleveland. Mr. Geisinger will have charge of the company's activity in the organic chemistry field.

Kline A. Ables, succeeds **C. C. Wolf** as assistant general purchasing agent of PHELPS DODGE CORP., Douglas, Ariz. Mr. Wolf will continue with the company however, having special duties in connection with the Bisbee East Ore Body program.

Tom B. Nantz, named plant manager for the B. F. GOODRICH CHEMICAL CO., Cleveland.

Russell W. Knode, formerly assistant export manager, named manager of the export department of the JEFFREY MFG. CO., Columbus, Ohio. **L. E. Bixby,** named manager of the contract division.

Henry E. Warren, Jr., appointed assistant general superintendent, and **Forest J. Smith,** appointed assistant to general superintendent of the Fairless Works, of U. S. STEEL CO., Morrisville, Pa.

OBITUARIES

Walter Geist, 56, president of the Allis-Chalmers Mfg. Co., died January 29, 1951, in Milwaukee.

Ralph A. Shaffer, 76, associated with Simonds Saw and Steel Co. for nearly 50 years died recently at his home in West Newton, Mass.

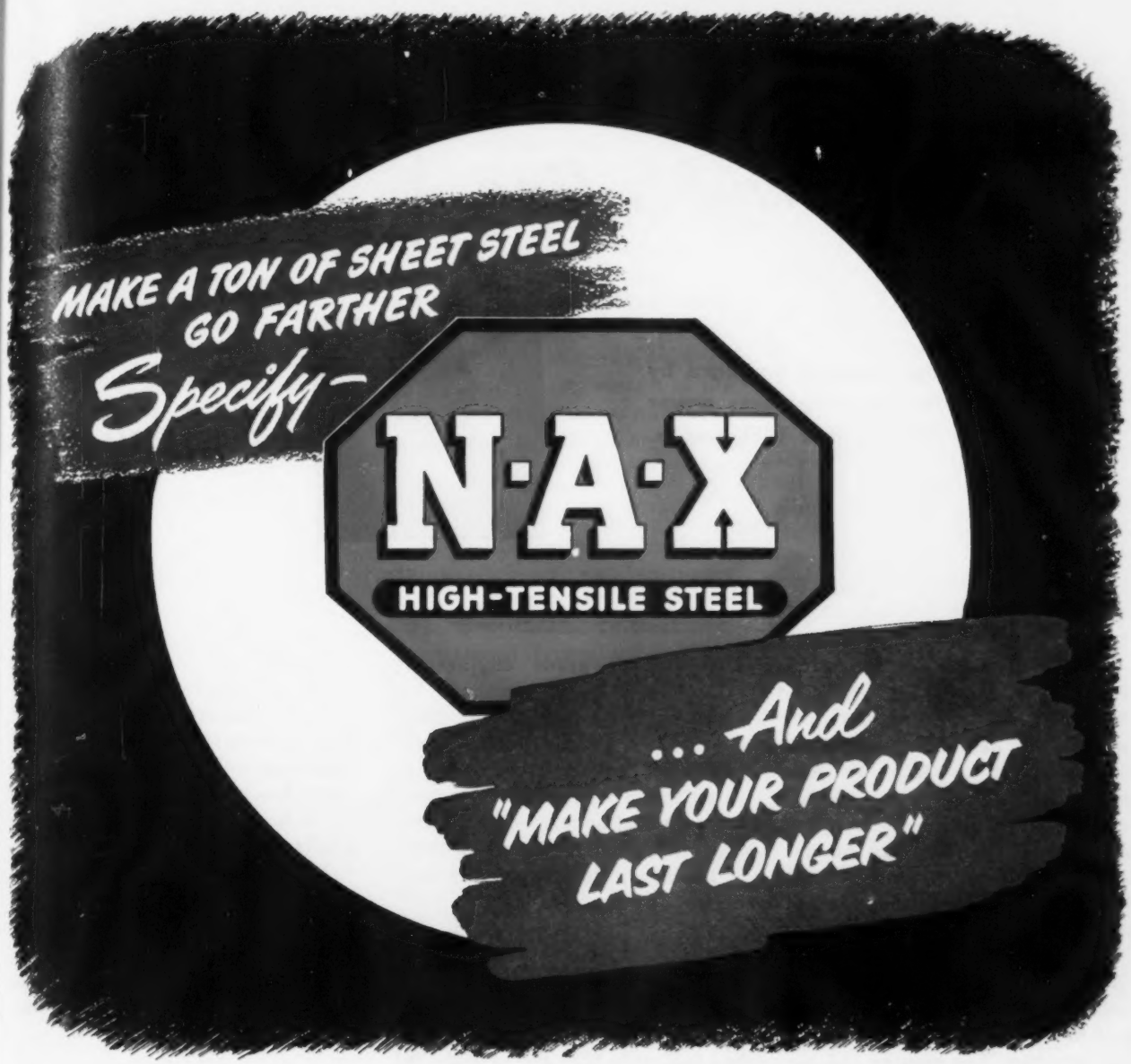
Paul William Lawrence, 60, founder and president of the Lawrence Steel Co., at Los Angeles died recently.

Arthur D. Saul, 72, president of Avery and Saul Co., Cambridge, Mass., died recently at Arlington, Mass.

Frank M. Nyiro, 37, a salesman for Republic Steel Corp., Chicago, was killed in a traffic accident recently.

Preston L. Kelsey, 47, sales executive of the Norge Division, Borge-Warner Corp., Chicago, died recently.

Hubert C. Reynolds, engineer attached to the executive staff of Chrysler Corp., died recently in Detroit.



Now, more than ever before, America must make full use of its steel-making capacity and conserve its natural resources. Now, more than ever, there is national significance in the phrases, "*Make a ton of sheet steel go farther*" and "*Make your product last longer.*"

These low-alloy, high-tensile steels do "make a ton of sheet steel go farther"—for their inherently higher strength is 50% greater than mild carbon steel. That means, in turn, that 25% less section can be used with safety, and where rigidity is important, this can usually be compensated for through slight design change.

"Make your product last longer" is no idle claim. The much greater resistance of N-A-X HIGH-TENSILE to corrosion, abrasion, and fatigue assures longer lasting products even at reduced thickness.

Explore the potential economies to be derived from the use of low-alloy, high-strength steels—and then specify them. Their use can add materially to our national conservation program.

GREAT LAKES STEEL CORPORATION

N-A-X Alloy Division, Ecorse, Detroit 29, Michigan

NATIONAL STEEL CORPORATION

on the assembly line

automotive news and opinions

Special machine builders barraged by orders . . . Gemmer introduces power steering . . . Olds shows 1951 models.

by Walter G. Patton

Million Dollar Backlogs — Detroit's already crowded special machine builders are being barraged with new defense orders. Million dollar backlogs for relatively small builders of special tools are common. One firm has indicated the percentage of defense orders on its order board has jumped from 1 to 30 pct in the past few weeks.

Burden on Used—Used machine tools are expected to play a prominent part in Detroit's war production program. For months the demand here for used machinery has been strong. There was some tapering off locally—but not nationally—during the final 2 months of 1950. Since the turn of the year, business has been brisk.

Many used machines are bringing prices higher than the original selling price. There are also reports that several used machinery dealers are trying to lease their equipment rather than sell the machine outright. There was some leasing of equipment here during World War II.

Skilled Help Scarce — Despite threatened layoffs in auto plants, highly skilled help is very difficult to find in Detroit. Skilled tool makers are in great demand. There have been recent reports of raiding of high grade engineering talent. Some of the demands for engineers originate with small concerns setting up to take on war business. Detroit's population of small tool shops and engineering firms multiplied tremendously during World War II. The same thing is beginning to happen all over again.

Speculation on Chrysler—There is still considerable speculation about the new Chrysler engine plant at Trenton, Mich. Chrysler has indicated that the original intention was to use this plant for civilian production. Latest guess is that the company had in mind a new plant to build marine, truck and industrial engines.

The Little Luxuries—Radios and heaters are among the list of auto accessories that are expected to become short. Most car accessories are expected eventually to be listed as non-essential. Meanwhile, car dealers are expected to husband carefully their supplies of rear seat radio speakers, antennas, spot lights, fog lights, rear view mirrors, electric clocks, windshield visors and other accessories.

Types of War Work—As pointed out by Arnold Lenz, new general manager of Pontiac, recently, there are two types of war work. The first consists of items like small ammunition, all kinds of shells, small rockets and cartridge cases. Such items can be tooled up in 4 to 8 months, depending on availability of machines.

The second class of items includes guns, tanks, planes, engines of both reciprocating and jet types. These latter items may require from 8 months to more than a year for tooling and they also take up a lot of floor space.

Dust Tunnel—The effect of dust on engine life and engine performance is being studied at Dexter, Mich., in a new dust tunnel and air laboratory built by Fram Corp., Providence, R. I.

This is the first tunnel designed and equipped especially to determine the effect of dust on motor vehicles. Dust conditions of a city street or the Sahara Desert can be duplicated in a matter of minutes. Effect of dust on engine wear and the effectiveness of filtering devices can be accurately judged.

Constant Analysis—In a separate building Fram engineers have established an air cleaner laboratory. Here, carburetors, air filters and oil filters are tested.

During the tests, air is injected

assembly line

Continued

into the tunnel's air stream which is constantly checked and analyzed for dust content. Weather and temperature conditions can be varied at will. Length of the test depends on the test car and the degree of protection provided for the engine. Tests are terminated when high blow-by, low oil pressure, audible knocks or loss of power indicate mechanical failure.

The new Fram facilities at Dexter are available for use by engineers and research men throughout the industry.

Power Steering—Many automotive executives regard power steering as the next major engineering advance. This week Gemmer Mfg. Co., Detroit, introduced the first power steering for passenger cars. (Power steering has been used for heavy duty and "off-the-road" vehicles for several years in its development phases.)

The new device will be available on 1951 Chrysler models. Other passenger car makers are also expected to offer power steering as soon as the new devices are available in quantity. In addition to Chrysler, Gemmer supplies Ford, Hudson, Kaiser-Frazer, Lincoln, Packard and Nash.

Increase Gear Ratios—With the advent of low-pressure tires gear ratios had to be increased. Responsiveness to steering was reduced correspondingly. Power steering makes possible the use of a 16 to 1 ratio. Most cars have about 26 to 1 ratio.

Gemmer's new "Hydraguide" quickens the response of the wheel in the driver's hands. Approximately 40 pct less steering wheel movement is needed. About 75 to 80 pct less physical effort is required to turn the wheel. Power control is instantaneous. The wheel straightens automatically after making a turn. When the engine is not running, the car steers like a conventional car although with greater physical effort.

Power Through Pistons—In the Gemmer design, power is applied through two pistons, operating in hydraulic cylinders placed on either side of an auxiliary power arm. This power arm is attached to the shaft between the roller gear and Pitman arm. The piston heads are connected by a yoke. A hardened roller on needle bearings permits accurate movement of the power arm. Steering action occurs only when pressure is applied to this roller *and only on one side at a time.*

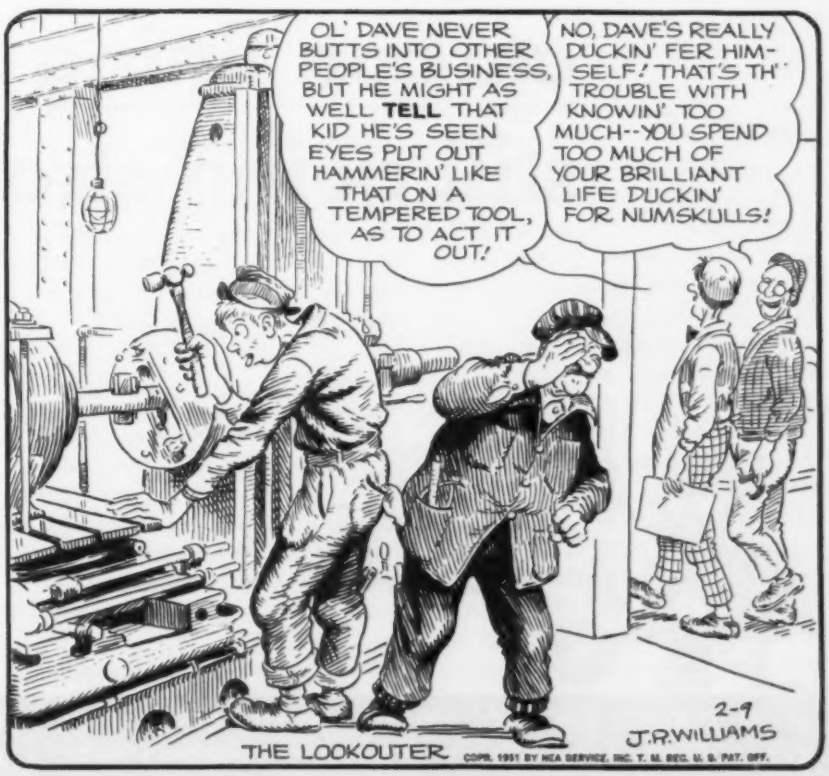
Oldsmobile Features—Improved engine efficiency, new springing that eliminates the dip on fast starts, new decorative treatment, a redesigned frame and an improved "hot operating" type of muffler have been incorporated in the new 1951 Oldsmobile.

Compression ratio of the Series 88 and 98 models has been raised to 7½ to 1. The increase has been made possible by redesigning the combustion chamber. A new carburetor, distributor, air cleaner and water-proof sleeves on the spark plugs result in improved engine performance.

More Leg Room—The new Olds leaf-type rear springs are 58 in. long and 2½ in. wide. Leg room has been increased in the rear seat by 2½ in. The cross-member of the frame is I-beam type instead of channel steel construction. The new Olds Hydra-Matic transmission permits rocking of the car out of ice, snow or mud, thus eliminating one advantage often claimed for a torque converter type transmission.

The use of standard gasoline at 7½ to 1 compression ratio has been made possible by redesigning the combustion chamber. Flame travel is shorter. A more effective "quench area" above the pistons is provided. Better gasoline and air mixtures are available.

THE BULL OF THE WOODS **By J. R. Williams**


OL' DAVE NEVER BUTTS INTO OTHER PEOPLE'S BUSINESS, BUT HE MIGHT AS WELL **TELL** THAT KID HE'S SEEN EYES PUT OUT HAMMERIN' LIKE THAT ON A TEMPERED TOOL, AS TO ACT IT OUT!
NO, DAVE'S REALLY DUCKIN' FER HIM-SELF! THAT'S TH' TROUBLE WITH KNOWIN' TOO MUCH--YOU SPEND TOO MUCH OF YOUR BRILLIANT LIFE DUCKIN' FOR NUMSKULLS!
2-9
J.R.WILLIAMS
THE LOOKOUTER
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UNION CARBIDE AND CARBON CORPORATION
30 East 42nd Street, New York 17, N. Y.
District Sales Offices: Atlanta, Chicago, Dallas, Kansas City, New York, Pittsburgh, San Francisco
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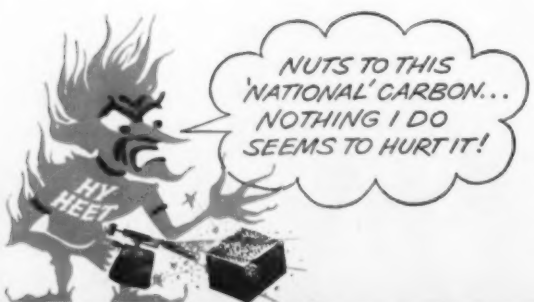
15 blast furnaces in the U.S. have each produced over 1,000,000 tons of iron on a single "National" carbon lining . . . and are still going strong!



BLAST FURNACE LININGS • BRICK • CINDER NOTCH LINERS • CINDER NOTCH PLUGS • SKIMMER BLOCKS • SPLASH PLATES • RUNOUT TROUGH LINERS • MOLD PLUGS • TANK HEATERS

west coast progress report

digest of far west industrial activity

by R.T.Reinhardt

Utah Steel Production Up—Steel production in Utah during 1950 was far ahead of 1949, according to the University of Utah.

Ingot production was 1,400,000 tons, up 42 pct from 1949. Pig iron production was 1,215,000 tons, an increase of 32 pct; and coke production was 1,206,700 tons, an increase of 20 pct. Coal production was 6,300,000 tons, an increase of 7.4 pct.

Copper and gold production showed a large increase over 1949 but lead, zinc and silver were down.

Strip Mill Announced—Seidelhuber Iron and Bronze Works of Seattle, Wash., plans an electric furnace and small strip mill, possibly with a maximum width of 12-in.

A $1 million corporation has been formed by Frank Seidelhuber, Jr., vice-president of the parent company.

Good 6-Months Report—Kaiser Steel Corp.'s first earning report since it sold $125 million worth of securities and paid off its RFC loan indicates that for the 6 months ended Dec. 31, 1950, net income after Federal taxes was $4,322,792.00, equivalent to $1.23 per common share, after payment of preferred dividends for November and December.

Net sales were $47,177,365.00 and miscellaneous income was $1,642,710.00. Profit for the 6 month period before taxes amounted to $7,879,854.00 and income taxes totaled $3,557,062.00.

Kaiser Aluminum & Chemical Corp. is negotiating for private financing involving $115 million to pay off indebtedness to the government and expand production facilities, probably in Texas.

More Gas for Utah—Salt Lake City industrialists hope a new natural gas field, on which Utah Natural Gas Co. has applied for a $32 million loan to build a pipe line in Salt Lake City, will solve their fuel problems.

The field is located in southeastern Utah where the first well is producing 1,500,000 cu ft daily.

Another potential source of gas is New Mexico provided the Utah Pipe Line Co. is granted permission by the Federal Power Commission to build a 392 mile long pipe line.

Power Hungry Northwest — A $26 million hydro-electric dam on the Lewis River in southwestern Washington is planned by the Pacific Power & Light Co. which would add 100,000 kw to the system by the end of 1952.

Columbia Shows Signs of Life—Rumors grew that Columbia Steel's President Alden G. Roach would, before long have an important announcement regarding the partially-occupied Los Angeles works of Columbia. The plant was operated during World War II by Alcoa.

Rheem Into Aircraft — Rheem Mfg. Co. has formed an aircraft division headed by Laurence H. Cooper, formerly with Pacific Airmotive Corp. and has contracted for a building with 200,000 sq ft on 50 acres of land at Southgate, near Los Angeles. During the last war Rheem did considerable contract work for many southern California air frame manufacturers.

Hand Tool Pinch—Users of hand tools in the metalworking industries in the West are finding that their suppliers of eastern made tools are quoting as much as 5 months on deliveries.

Principal bind seems to be on those tools utilizing both iron and steel castings, few of which are made on the West Coast. Western hand tool producers are making prompt deliveries as in the past and apparently have been unaffected thus far by material shortages.

Wrenches and other tools in which a number of alloys are used are particularly tight. Even DO orders issued by the Armed Services here in the West on eastern manufacturers are being filled 4 months after placement and another 30 days in transit.

Cut Production Costs

LATROBE

DESEGATIZED BRAND

HIGH SPEED STEELS
HI CARBON – HI CHROME DIE STEELS

✻ FULL UNIFORMITY

✻ QUALITY CONTROL

CAREFUL SELECTION OF RAW MATERIALS

CONSISTENT MELTING PROCESSES

ACCURATE FINISHING STANDARDS

RIGID INSPECTION PRACTICES

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the federal view

this week in washington

by Eugene J. Hardy

Steel Balks at CMP — For the first time since the government began carving up the steel pie, the National Production Authority and the steel industry have differed widely. Here's the story: NPA, as is well known, hopes to institute a Controlled Materials Plan by mid-year. In addition, an order limiting the amount of steel that can be used by major civilian consumers, notably the auto industry, is in the works.

Last week, the Steel Products Advisory Committee went on record as opposing both CMP and cutbacks in specific uses of steel. It said, in formal resolutions, that no cutbacks should be made without prior consultation with the committee as to the uses of the steel that would be freed under such orders. Generally, the committee felt that existing procedures DO orders and allocation programs will provide adequate steel for defense and essential civilian needs.

Harrison's Decision—The decision to invoke CMP and percentage cutbacks was made by Defense Production Administrator W. H. Harrison. Chances are that he will go right ahead with these plans. In any case, there is no thought of imposing anything like WPB Order M-216 which prohibited the use of iron and steel in about 1200 items.

Wage Disputes Agency—A behind-the-scenes yak session concerns the advisability of making the Wage Stabilization Board the disputes-settling body for defense industries. Labor would welcome such a set-up and industry doesn't like it. Industry wants WSB to continue as a policy-setting body, for if it gets into disputes it is felt that every wage controversy will go immediately to WSB as the agency that can change policy.

Mark-Up Formula—Planning at the Office of Price Stabilization indicates that eventually practically all price control will be based on a mark-up formula permitting cost increases to be passed on to the consumer. The only exceptions would be basic raw materials which would be covered by specific dollar-and-cents ceilings. OPA got around to a similar method of control toward the end of World War II, but in a very limited way.

Basing Points Again — Interested Congressmen are still pulling for legislation denied to end the basing point controversy and affirm the legality of freight absorption and delivered prices.

A bi-partisan group of six Senators led by Sen. McCarran, D., Nev., has introduced S. 719 which would rivet into law the Supreme Court decision in the Standard Oil of Indiana case involving good faith price discrimination (THE IRON AGE, Jan. 11, p. 95). The measure would amend the Clayton Act so that it will be "a complete defense to a charge of price discrimination for the seller to show that its price differential has been made in good faith to meet the equally lower price of a competitor."

"Complete Solution" — Enactment of S. 719, says Sen. McCarran, "will end the so-called basing-point controversy." Sen. Johnson, D., Colo., another sponsor of the bill and Chairman of a committee which has blasted the Federal Trade Commission for its inaction since the President vetoed S. 1008, calls the measure a "complete solution to the freight absorption problems, for freight absorption is merely one means by which a seller reduces his price to meet price competition."

Contracts — President Truman has authorized the Defense and Commerce Depts. to negotiate contracts without asking for competitive bids. The action, taken under a recent act of Congress, authorizes the ignoring of "advertising, competitive biddings, and bid payment, performance, or other bonds or other forms of security." Cost-plus-a-percentage-of-cost contracts are not permitted.

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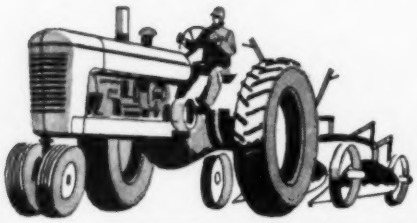

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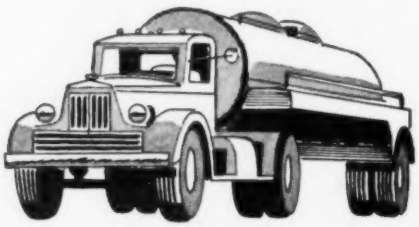

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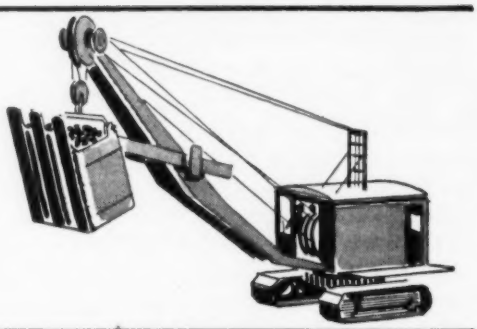

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BLUEPRINT FOR HARD WORK: This is Moisie River Canyon near Seven Islands. The point from where this picture was taken is the end of a tunnel now being bored. The railroad will follow the Moisie River up the terrain on the right side.

Personal initiative builds 360-mi railroad to Quebec-Labrador iron ore field

Seven Islands, Quebec—Personal initiative is at work with a bang here—even though the temperatures range from 5° above to 15° or 20° below zero. This will be the railroad terminal and the location of mammoth ore docks and storage for the Quebec-Labrador iron ore development (see IRON AGE, Nov. 4, 1948, p. 155).

What many called publicity just 3 years ago is today a live, surging race to get ore out of upper Quebec and Labrador by spring 1954. Preliminary construction of the railroad has started; full scale work will begin this spring.

The ore is needed. The five American steel companies (see IRON AGE, Oct. 19, 1950, p. 93) which are part of the Iron Ore Co. of Canada are banking on getting the material as soon as possible.

Newcomers wag their heads over the difficulties to be faced in building the 360 mile railroad from here to Knob Lake. But those who have been here a couple of months say "Sure it's tough, but we will do it, and ahead of time."

Excuses don't count up here. Nobody wastes time telling why things can't be done; they use that time to find ways of doing things. There is a minimum of fanfare and a maximum of self reliance. Rules there are, but they aren't needed too much—there is not much else to do in waking hours except work.

On the following pages is a pictorial report made by the writer at Seven Islands and at Knob Lake and Burnt Creek 320 miles to the north on Jan. 9, 10, 11 and 12.

RETURN VISIT: On the left is Norman Delmage, winter boss at Burnt Creek, 320 air miles north of Seven Islands, Quebec (roughly 1100 air miles north of New York City). On the right is Tom Campbell, IRON AGE editor—writer and photographer on this story who was also there in 1948.

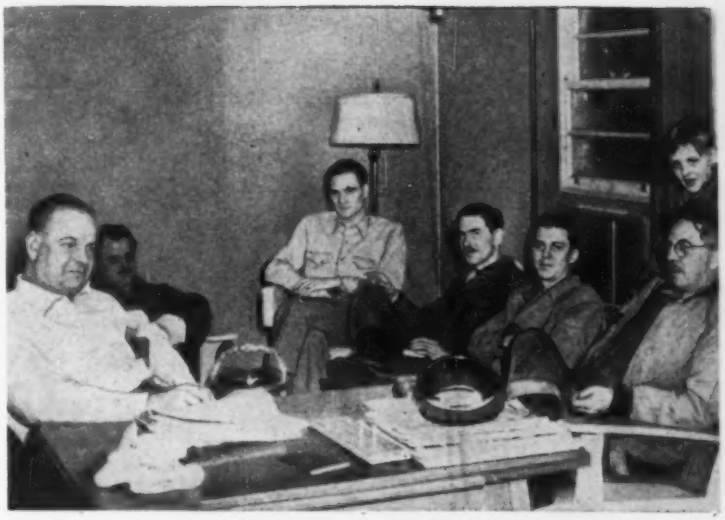
Fast Work: This temporary dock at Seven Islands was built in record time. Between early October and early December last year the dock had been completed and about $8 million worth of equipment and material unloaded before the freeze-up. Track was laid from yards to dock so equipment could be unloaded onto flat cars from small boats on the side runways to the dock and from big boats at the end of the dock.

Waiting for Work: Dump trucks, regular trucks, big trucks, little trucks and snowmobiles have all been moved in for one of the biggest railroad construction jobs in recent history. Here are a few pieces of the equipment. The weird-looking cars in the middle are snowmobiles with treads in the back and skiis in the front for steering. They make about 25 to 30 miles an hour over the snow no matter what the depth. They can haul about 12 people.

Sleeping Giants: These shovels, Caterpillars and other machines were shipped in before the freeze-up on the St. Lawrence River. Canadian and American firms did a wonderful job in getting equipment together in a couple of months time. Many of these shovels will be knocked down and flown 85 miles north from Seven Islands to Waguna, a base construction camp. About 100 miles of the road will be completed this year.

On Top of the Job: That fellow on top is both happy and anxious. He is Fred Bolton of Armco Drainage & Metal Products of Canada. He is happy about the stockpile of culvert pipe for the big railroad job and anxious to get more that will be needed. Since Fred is an ingenious, friendly and hardworking guy the project will get what it needs. Fred is taking a picture of an Armco steel building being erected a few feet away. This job is his pet.

Genial Brass: Here are the two big fellows on the 360 mile railroad project. Do they look worried? To the left is Hector MacNeil, chief engineer, Quebec North Shore & Labrador R.R. Formerly a Canadian National R.R. chief he knows his stuff. To the right is Karl Collet, supreme representative of contractors, Cartier, Mannix and Morris-Knudson. He knows his way around. These men will take the raps and the praise. There will be lots of both.



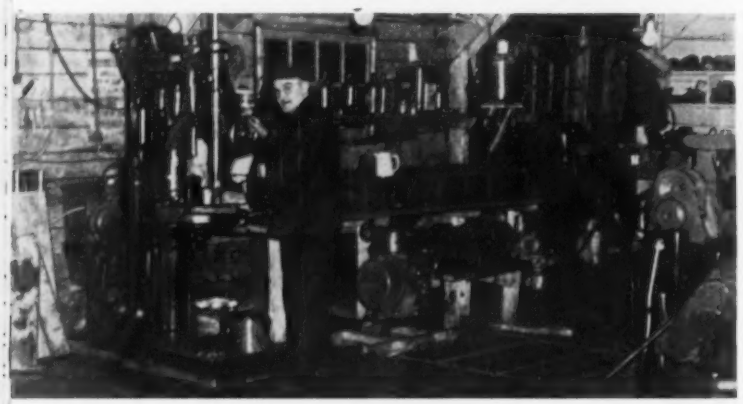
Give and Take: There have been and will be many of these chatty and informal meetings before the railroad is finished. To extreme left is Karl Collett, contractor boss, and to extreme right is Jack Little, field boss on the ore project. They are knee deep in a serious discussion—lumber to build camp after camp for engineers and workmen. Meetings like these between ore company men and contractors' people are setting records in fellowship.

A Big Morale Builder: In bush, mining, railroad, construction and lumber camps food has to be good. But the cook is the one who has to be almost perfect. Food—lots of it and properly prepared—is put down as 50 pct of the morale building in any camp. On the right with the dough on his hands is Joe Davis, cook at Seven Islands airport-base for field and engineer corps. Those things in the pan on the stove are light fluffy donuts.

Blast Away: The rock floor where these men are standing has been partly drilled and dynamite placed in holes. About 8 ft will be blasted off the hillside. A tunnel will be driven through the mountain in the background. The foreground will be approach to 700 ft bridge across the Moisie River shown on the first page of this story. This bridge—150 ft above the river—will eliminate five tunnels in original plans. It's cold, but work goes on.

Pile Driving at 16 Below: On Jan. 10 these fellows were hard at work repairing the end of the temporary dock at Seven Islands. It took a lot of beating from boats, ice and waves. Permanent ore docks will be farther up the St. Lawrence River. Shipping will be open for ore boats 9½ to 10 months a year. In emergencies the season could be 12 months but ice breakers might be needed at times. By 1954 heat may be used to thaw ore.

Winter Scene: Here is the base camp for the iron ore project. Burnt Creek is the name. The Knob Lake airport is about 12 miles from the camp. About all that is being done now at Burnt Creek is repairing and maintenance of equipment. Only access is by plane. Buildings are log cabins and quonset huts. When mining starts in 1954 the season will be at least 5½ months a year. Some feel a longer mining season is possible, if necessary.



No Shutdown: This is part of the maintenance and repair shop at Burnt Creek. Drills, trucks, jeeps, snowmobiles and everything else is worked on here. When this picture was taken on Jan. 10 the temperature was about 26° below zero outside. A maintenance force of about 20 men is here throughout the winter. The lowest temperature in December was 42° below zero, the highest 39° above and the mean 0°. It will be colder this month and next.

Hut Flies Everything: Hollinger Ungava Transport (HUT) planes number eight. Three are Douglas C-47's, others are Norseman and Stinson. This Doug has landed at Knob Lake air field—and Canadian weather station. To left on plane is pilot Wes MacIntosh; to right is copilot Hank Gates. These fellows have hauled everything from 75-ton shovels to big churn drills—knocked down of course. They and their buddies have a lot of work ahead of them.

Integrally-stiffened sheet can be made by rolling-in stiffening ridges as the sheet stock is processed at the mill. Such material will find many aircraft structural uses, and has potential uses in other industries. Castings, because of low strength and high weight, will find only limited use in replacing fabricated aircraft assemblies.

INTEGRALLY-STIFFENED SKIN REVOLUTIONIZES AIRCRAFT CONSTRUCTION

rolled and cast sections

SECOND OF A SERIES

One of the most promising methods of making integrally-stiffened sheet is by rolling stiffened ridges into the sheet stock as it is processed at the mill. The problem to date has been the determination of sizes, proportions, and materials which would be most satisfactory for structural applications and still be reasonable to produce by rolling. Sections suitable for rolling are illustrated in Fig. 6.

Rolled-ribbed sheet is far superior in rigidity to unstiffened sheet of the same total weight. Because of limitations of the rolling operation, however, it cannot be made to compare in efficiency with a built-up skin-and-stiffener structure. Its advantages therefore lie only in applications where adequate skin-stiffening by ordinary methods is impossible or impractical. A large portion of the exposed surface of every airplane falls in this category.

Good For Lightly Loaded Surfaces

In such places as trailing edge surfaces and control surfaces, applied loads are so light that skin gages are the minimum as determined by handling requirements, stiffeners are as close as production expense will allow, and surface roughness and "oilcanning" still remain a problem. For this purpose, the light gage section shown in Fig. 7 has been proposed.

One factor in use of this material is the expense of getting started. The procurement of rolled-ribbed sheet in a structural alloy will involve considerable initial expenditure for rolling equipment. Ribbed sheet was once rolled in production by the Aluminum Co. of America for the refrigerator trade. In this instance a soft alloy was used. The section produced is the lowermost one shown in Fig. 6.

Developmental work on the equipment and techniques of rolling ribbed-sheet stock is currently in progress at Reynolds Metals Co. under Air Force contract. Results to date have indicated that the desired shapes can be produced in any alloy, but that very heavy rolling equipment will be required to make light gage sections such as that of Fig. 7. There have been experiments with reducing the gage of rolled sections by etching.

Application of rolled-ribbed sheet to aircraft structures has been under continued investigation at Lockheed and several experimental designs have been constructed using ribbed sheet made by machining from plate.

As a result of these studies the section shown

By P. E. SANDORFF, *Research Engineer*
and GEORGE W. PAPEN, *Manager, Production Engineering Dept.*
Lockheed Aircraft Corp., *Burbank, Calif.*

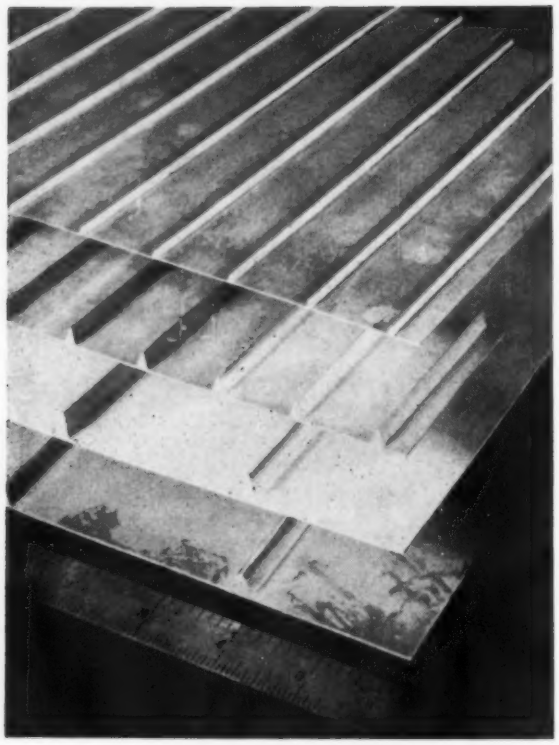


FIG. 6—Samples of some integrally-stiffened sheet sections which can be produced on a rolling mill. Three of these were simulated by machining from plate. The bottom section was actually rolled. It was produced, a few years ago, for the refrigerator trade.

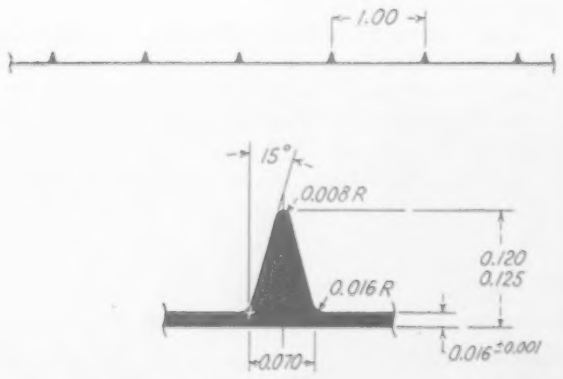
Integrally-stiffened skin

continued

in Fig. 7 has become standardized. The total weight of this product is the same as that of plain 0.020-in. sheet, but its rigidity is more than 20 times as great. This one section, it has been found, can be applied much like ordinary sheet stock in place of 0.016-in., 0.020-in., and 0.025-in. skin used in conventional designs, with reduction in parts, increase in rigidity, and possible weight saving.

An experimental aileron tab structure was constructed identical in function and strength to the aileron tab of the Constellation airplane. The surfaces and beam of this tab were formed in one piece from simulated rolled-ribbed sheet stock. This skin section replaced the 0.016-in. outer skin, 0.016-in. beaded inner skins, and the 0.032-in. beam web in the conventional design. Enough weight was saved here with rolled-ribbed sheet to permit use of a casting for the central actuator fitting. Thus considerable simplification was achieved, and it was estimated that even if the rolled-ribbed sheet were to be machined for production, a net saving could be achieved. Parts and cost comparison are indicated in Table I, and the structure is shown in Fig. 8.

FIG. 7—A proposed rolled-ribbed sheet section developed by Lockheed. Its weight would be equivalent to standard sheet 0.020-in. thick, but rigidity in the direction of stiffeners would be 20 times greater.



Used For Wing Trailing Edge Structure

The trailing edge surfaces of the Constellation wing carry no wing bending loads, but only the direct air loads of low magnitude which are transferred forward immediately to the main wing structure. Consequently the aft surfaces are made as light as possible, the skin gages and stiffening being determined chiefly by handling requirements, manufacturing problems, and oilcanning tendencies.

An equivalent structure made with rolled-ribbed sheet is illustrated in Fig. 9. The excellent smoothness is evident from the photograph Only half as many ribs were required, and the necessity for contour-formed chords was eliminated. Comparative data and cost estimates for the 60-in. section in conventional structure and as designed with rolled-ribbed skin are presented in Table I.

On lightly loaded trailing edge structure, the use of rolled-ribbed sheet with stiffening elements oriented chordwise often provides sufficient rigidity and strength so that all internal framework can be eliminated. For example, the aileron trailing edge of the Constellation airplane is constructed of 0.020-in. skin supported by many light ribs spaced 4 in. apart. An alternate design using rolled-ribbed sheet gives a

FIG. 8—The 11 parts of an aileron tab structure using ribbed sheet. Its estimated production cost, with the sheet produced by machining from heavy plate, would be $129. The same structure produced by conventional means would have 33 parts, not counting rivets, and would cost $202. If sheet with rolled-in ribs were used, the cost saving would be considerably more.

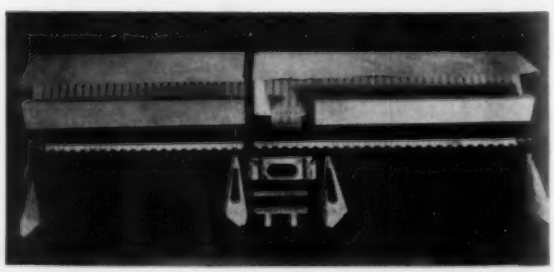


TABLE I

ROLLED-RIBBED STRUCTURES COST LESS

	Aileron Tab		Wing Aft Structure	
	Integrally Stiffened Construction	Conventional Construction	Integrally Stiffened Construction	Conventional Construction
Total weight per unit	4.65 lb	4.80 lb	28.00 lb	28.00 lb
Total number detail Parts per airplane	22	86	116	152
Total number different parts per airplane	15	48	47	61
Rivets per assembly	220	490	1310	1380
Spotwelds per assembly	.....	560	.....	2260
Cost (based on production of 50 airplanes)				
Material	$25.02*	$ 4.57	$102.30*	$ 17.63
Labor	46.16	84.57	102.40	227.90
Tooling	58.05	112.85	79.80	123.10
Total Cost	$129.23	$202.09	$284.30	$368.63

* Includes total cost machining the integrally stiffened sheet from 0.125 in. plate stock.

structure in which all ribs were eliminated and a slight weight advantage was also indicated.

Several other advantageous applications for rolled-ribbed sheet have been suggested. Some of these are: Ducts, tanks, shell structures, leading edge skins, rib webs, fairing, equipment and furnishings, instrument cases, cabinets, junction boxes, cabin partitions and doors. Many suggested uses are outside the aircraft field; for example, roofing and siding, household furnishings, containers, etc.

Conventional Sheet Metal Tools Used

No new tools or special techniques are required to use rolled-ribbed sheet. It may be treated very much like ordinary sheet stock. However, sufficient bend radius must be allowed for bends across the stiffener sections, or ribs removed in the bend area.

Rolled-ribbed stock may be cut and trimmed with conventional power shears, if the stiffeners are protected from the clamping rams by a piece of heavy sheet used as a buffer plate. The portion to be trimmed away is placed under the blade, as this becomes irregularly bent. Gentle curvatures may be handled on ordinary rolls and sharp bends may be made with the power brake using conventional punch and dies. Excellent joggles have been formed on the power brake using shims and plates.

In some cases it is desirable to remove the stiffener elements over a portion of the rolled-ribbed sheet, to permit sharp bends, such as for a tab trailing edge, or to allow attachment to a plain flange. This has been accomplished satisfactorily as a routing operation, using a flat-bottomed cutter turning at high speed, and clamping plates adjacent to the area to be worked.

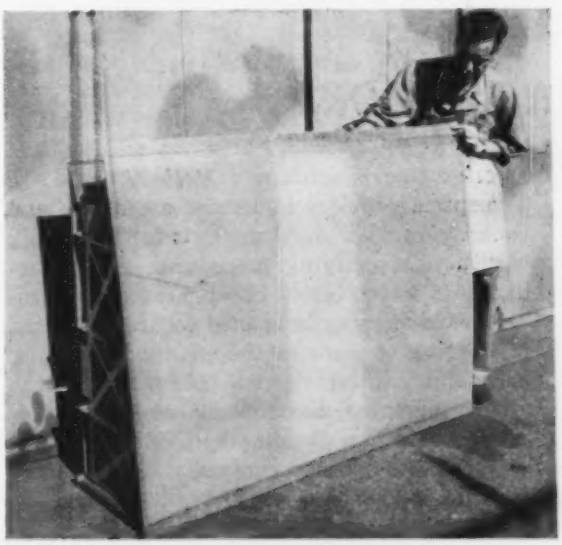
Casting, both sand and permanent mold, as a production method has inherent advantages because it eliminates many operations in preparation of the material as well as in fabrication and assembly of the part. It also permits the complexity of detail which is usually necessary for high structural efficiency. That it is not used more widely is due to several disadvantages.

One big disadvantage is that strength of cast material is generally only about half as much as that for the wrought alloy. Then there are technological limitations. As the size of castings is increased, the problems of warpage, shrinkage, homogeneity and porosity become more severe. If minimum thicknesses are too large, cast structure will not be able to compete on a weight basis. It should be noted, though, that casting methods are under constant development. Recent advancements in technique make possible designs of unusual size and thickness. New alloys also may provide several advantages. There is the magnesium-cerium alloy which has exceptional properties at elevated temperatures. There is also a magnesium-zirconium alloy which needs only aging to obtain good physicals. Heat treat, with attendant warpage, is not needed.

Intake Duct Cost

Some cast surface panels have been designed in which some saving in weight and considerable saving in cost are indicated. However, attempts have been made to apply casting design in similar fashion to other surface panels in both the F-90 as well as the F-80 airplanes, but weight penalties were too great. An example of another possible type of application for casting in the intake duct shown in Fig. 10. In this instance, a weight penalty is involved but possible cost savings are so great as to make it

FIG. 9—A wing aft structure fabricated with simulated rolled-ribbed skin. A large number of complex fabricated parts can be eliminated through use of rolled-ribbed skin in this part. And cost is considerably less.



merit consideration. Casting is particularly adaptable to this structure because it permits great irregularity in the shape and location of various elements, and eliminates forming and assembly operations which in this case are unusually difficult and costly.

Stiffening By Formed Beads Has Been Used

In several airplanes, notably the Republic Seabee, the Thorpe Sky-Skooter and, to a lesser extent, the Ford Trimotor, another method of obtaining integral stiffening was used. Integral stiffening was accomplished by rows of formed beads in the external skin surfaces.

This proven method has great advantage in simplification, reduction in parts, and reduction in cost. The Seabee airframe weighed 120 lb less, used 350 less parts, and required 2300 less manhours to assemble, when simplified by use of beaded structure. And the airframe tooling cost, based on 5000 planes a year, was only $400,000 as against $1,750,000 for the conventional prototype of the plane.

Rolled-Ribbed Better than Beaded Sheet

Despite this striking comparison, there is considerable objection to the use of formed-stiffened sheet in higher speed aircraft. It is aerodynamically undesirable because the formed stiffening elements cause irregularity in the airfoil surface. Forming properties limit the depth and shape of the integral stiffening element or bead to a small value. Thus generally this type of formed-stiffened sheet does not have the rigidity that would be available in the same weight of rolled-ribbed sheet. And, the beaded sheet is inadequate for loads of any magnitude acting in the plane of the sheet transversely to the direction of the beads.

It is probable that rolled-ribbed sheet will eventually be available as a purchasable material. This product will furnish all the functional advantages of formed-stiffened sheet, with few of its objectionable qualities.

FIG. 10—A cast magnesium air intake scoop, equivalent to a multipiece assembly now in use. This casting has a wall thickness of 0.100 in. For complex structures like this, casting offers an advantage, despite the fact that cast parts will usually weigh more than their fabricated counterparts.

This is the second in a series of four articles covering the manufacture and application of cast, extruded, forged, rolled, and machined integrally-stiffened structure.

NEW BOOKS

Inspection Organization and Methods, by J. E. Thompson, provides industrial executives and supervisors with tested methods for improving efficiency, simplifying procedures, and reducing costs in inspection departments. The procedures given may be applied regardless of the product being made or the quality level being maintained. Complete data necessary for the orderly planning, accomplishment and recording of inspection examination and testing are supplied. All modern equipment is discussed. McGraw-Hill Book Co., 330 W. 42nd St., New York 18. $5.00. 370 p.

Executive Action, by E. P. Learned, D. N. Ulrich and D. R. Booz, is addressed to business executives and to others who are interested in the practical aspects of business administration. It is a study of the problems which executives face in trying to get effective coordination at the top level as well as among the various parts of an industrial enterprise. It undertakes to state and deal with the problem of coordination in human terms, emphasizing the human factors in the background of executive action. Harvard Business School, Div. of Research, Soldiers Field, Boston 63. $3.25. 218 p.

MOLYBDENUM LUBRICANT

proves itself in tough tests

By ALFRED SONNTAG, *President*
The Alpha Corp., *Greenwich, Conn.*

During the past 2 years a large number of tests and practical applications have indicated that molybdenum disulfide is an exceptionally valuable addition to the small family of base lubricants. Some of its lubricity and antiseizing properties at extreme bearing pressures and at very high or very low temperatures surpass any other commercially available lubricant.

Molybdenum disulfide is a chemical combination of molybdenum and sulfur, chemically noted as MoS_2. It appears in nature as a mineral. It greatly resembles graphite in appearance and feel, but it is more than twice as heavy, having a specific gravity of approximately 5.

The chart gives typical results of a large number of press fit tests. Hardened, ground, and polished dowel pins 1.001 in. in diam were pressed into bushings hardened, ground and polished to a diameter of 1.000 in. The press fit interference of 0.001 resulted in a calculated bearing pressure of 10,000 psi. The parts were assembled in a Baldwin precision hydraulic testing machine at a uniform speed of 0.6 ipm. The chart shows the maximum force required to fully insert the pin for a variety of lubricants used on pin and bushing.

The solid black portion of the load scale in the chart represents the chatter range which may interpret the severity of localized seizure. The strange and exceptional fact that no load fluctuation was observed with silicone oil where friction reached the highest value remains to be more fully investigated. It may be assumed, however, that in this case seizure was not localized but was uniform over the entire surface, and was continuous. For white lead in oil the chatter range is indicated in dotted lines, because it was not observed on every specimen.

Chatter Distorts Parts

The worst effects of chatter during press fitting, besides the damage to surface finishes, are the dimensional distortions of the parts. Thin-walled sleeve bearings 4 in. in diam, with 3/16-in. walls, 2¾ in. long, manufactured with a required accuracy of 0.0001 in., distorted 0.0005 in. at calculated press fit pressures of only 1575 psi when chatter occurred.

On the basis of such results, a lubricating grade of molybdenum disulfide is finding in-

Molybdenum disulfide has long been known to have lubricating properties. But only during the last 2 years has it been available, free of abrasive impurities, for commercial use. Test and application data now accumulating show this lubricant has great value for high-temperature, high-pressure use, for breaking in machine bearings, and other rough duty.

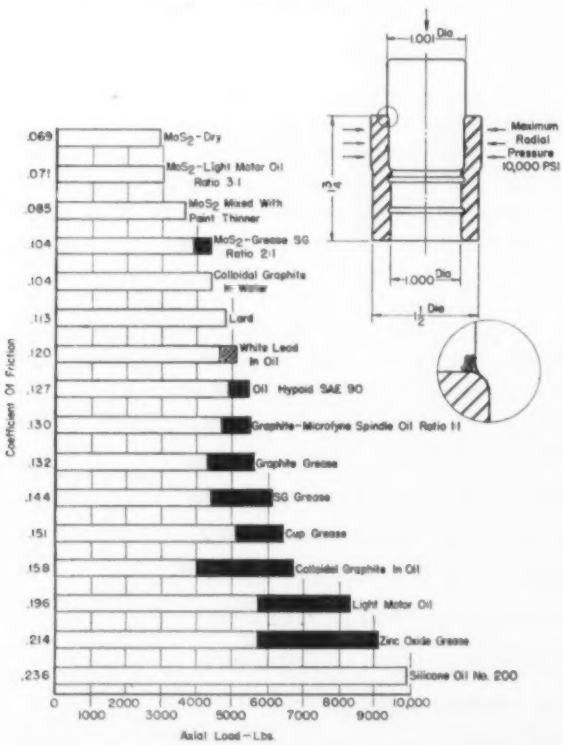
creasing commercial applications for the press fitting of sleeve and antifriction bearings and many other parts. Corrosion problems make colloidal graphite in water, and lard, which were next in line of performance in the above tests, less desirable.

MoS_2 mixed into a paste consistency with solvents or with lubricating oils having a viscosity of SAE 10 or lighter compare favorably with the dry powder application in the press fit test. However, a large number of test mixtures with heavier oils and greases were tested with less satisfactory results. This can be seen in the values for MoS_2—grease SG, in the chart.

According to a widely accepted theory, the molecular structure of MoS_2 is of the laminar or sandwich type, composed of a layer of molybdenum atoms with a layer of sulfur atoms on each side. The sulfur atom layer has an affinity for metal surfaces and adheres strongly to them upon contact. The bond between two adjacent sulfur atom layers is weak and they slip easily upon one another. This theory accounts for the tenacity of adherence as well as the lubricity of MoS_2. With reference to adherence, it should be noted that repeated and severe scrubbing with solvents will not remove all of the MoS_2. How much is removed in this manner has not been determined, but friction tests show that a sufficient deposit remains to lubricate, and a mild abrasive operation is required to remove all traces. Because the sulfur in MoS_2 is chemically combined, it does not exhibit the chemical reaction with metals that free sulfur does.

Ordinary mixtures of the heavier oils and greases seem to coat the MoS_2 particles, thereby destroying their affinity for attachment. In the inset in the chart, an enlarged cross-section of the bushing corner is shown. The elastic deformation of the pin and the sizes of coated MoS_2 particles are highly exaggerated. Oil or grease film coated MoS_2 particles are mostly retained at the entrance.

SUPERIOR LUBRICITY of molybdenum disulfide is demonstrated by this table of test results. Data were obtained by measuring load required to force a 1.001-in. pin into a 1.000-in. bushing, making a 10,000 psi bearing pressure, as shown in cross-section at top right. Black areas represent load range in which chatter was observed. The area shaded for white lead in oil represents range in which chatter was observed in some, but not all, tests. Inset shows, exaggerated, how MoS_2 particles are scraped off pin when mixing with grease destroys adherence by coating particles.


1.001 Dia
Maximum Radial Pressure 10,000 PSI
1.000 Dia
½ Dia
Coefficient Of Friction
.069 MoS2 - Dry
.071 MoS2 - Light Motor Oil Ratio 3:1
.085 MoS2 Mixed With Paint Thinner
.104 MoS2 - Grease SG Ratio 2:1
.104 Colloidal Graphite In Water
.113 Lard
.120 White Lead In Oil
.127 Oil Hypoid SAE 90
.130 Graphite - Microfyne Spindle Oil Ratio 1:1
.132 Graphite Grease
.144 SG Grease
.151 Cup Grease
.159 Colloidal Graphite In Oil
.196 Light Motor Oil
.214 Zinc Oxide Grease
.236 Silicone Oil No. 200
0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10,000
Axial Load - Lbs.

For Lifetime Lubrication

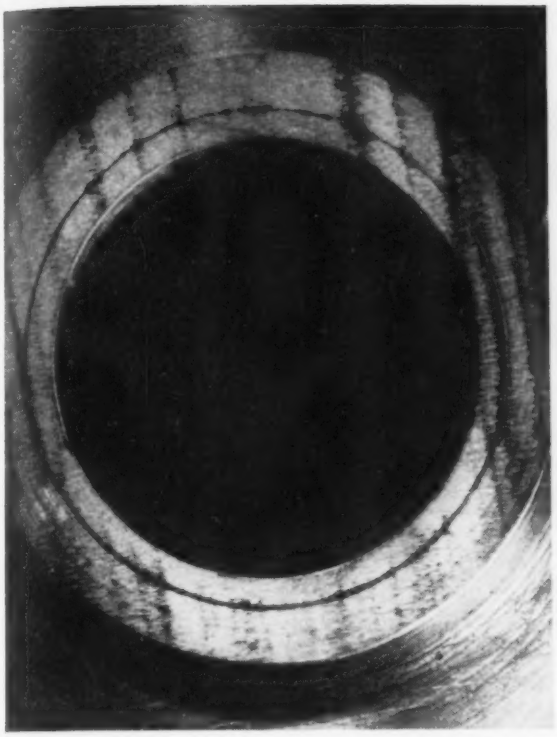
For a variety of other applications, however, mixtures of MoS_2, even with heavy oils and greases, have been highly successful. In one particular problem of gear lubrication a single coating of a mixture consisting by weight of one part of MoS_2 and 1½ parts of a medium heavy oil served as a long-sought-for lifetime lubricant. In such cases, mechanical action crushes through the oil or grease film, and the affinity of the MoS_2 for attachment is restored.

There will be uses in the low and high temperature field. MoS_2 appears to be unaffected by low temperatures, and while it oxidizes at elevated temperatures, the rate of oxidation in air doesn't assume practical proportions below 750°F. And in the absence of air it is usable to at least 1000°F. Other types of lubricants now available for low or high temperatures are limited to relatively low bearing pressures.

When a lubricating grade of MoS_2 was first made available to industry, a large number of different applications now being made were never suspected. This was mainly because it was thought that aside from the metal forming field, bearing pressures as extreme as those in heavy press fits were rare. But experience has shown that actual bearing pressures in moving parts are nearly always underestimated and the need for extreme bearing pressure lubricants exist where often not suspected.

By way of example, a check was made on wear test specimens which had been ground with more than usual commercial care and accuracy. One is shown in the accompanying photograph. It was found that less than 10 pct of the total area made metal-to-metal contact in the beginning of a run. Another investigator, using electrical methods for measuring actual metal contact areas of commercially ground surfaces, found only about 5 pct.

MoS_2 is being used now successfully in the machine tool industry for breaking-in. In some



CALCULATIONS of bearing area usually assume that the entire area shares the load. But this is not true during breaking-in, as this wear test ring shows. Dark areas, only about 10 pct of total area, show where wear occurred. Thus during breaking-in, lubricant was subjected to much higher than calculated bearing pressures.

cases the powder is rubbed into the bearing surfaces, serving as an undercoat for conventional lubrication, and thereby protecting high spots against galling and seizing. In other uses it is applied in paste form, mixed in varying percentages with oils and greases. For breaking-in heavy pinion assemblies, mixtures of 2 pct MoS_2 with grease have proved successful with gears reported running cool for the entire break-in period of 9 hr, whereas without the addition of MoS_2, excessive heat required disassembly and scraping every 2 hr.

Cuts Torque on Threads

The use of MoS_2 on threads for low, room and elevated temperatures is increasing. To reach a tension of 4000 lb, which amounts to 13,000 psi in a ¾-10 threaded assembly, 70 pct less torque was required, when a mixture of MoS_2 and light oil was used on threads and under the washer of the nut, compared with zinc oxide, white lead and graphite grease.

A series of tests on threaded connections lubricated with MoS_2 and exposed to temperatures of 800°F for prolonged periods showed that the break-away torque was 10 pct less than the makeup torque, leaving clean and undamaged threads. Reports that MoS_2 prevents the freezing of threaded connections after being subjected to temperatures up to 1100°F, are quite frequent.

In the field of stainless steel lubrication, the reception of MoS_2 has been good, especially for thread lubrication and in general for mating stainless steel parts. It has been used with good results for very severe stainless steel drawing and cold forming operations.

Others report that if occasionally applied to precision drawing dies, MoS_2 preserves the finish and reduces the frequency of expensive polishing with diamond compounds. In other cases expensive hand finishing of dies was dispensed with because the picking-up of metal at high spots in the dies was eliminated by occasional applications of MoS_2.

A method of applying a bonded coating of MoS_2 was developed some years ago by T. E. Norman. It consists of mixing equal parts by weight of MoS_2 with corn syrup, the latter serving as an organic binder, and painting this mixture on a metal surface which must be heated to at least 650°F. This forms a thin and tenacious coating approximately 0.0002 in. thick, bonded to the metal.

The Cleveland Laboratories of the NACA have reported on experiments with such coatings and found them to be very effective in reducing friction at high sliding velocities and very extreme contact pressures, and for reducing fretting corrosion. While MoS_2 by itself appears to have no anti-corrosion properties, Norman-processed samples have shown considerable corrosion resistance in salt spray tests.

Grease Film Type Developed

The advantages of such coatings for practical applications, less severe than the ones on which the NACA tests were based, remains to be investigated. The NACA bonded coatings were limited to steel surfaces, but the same method has been used experimentally on stainless steel, aluminum, brass, and copper, and by appearance an equally good coating was obtained.

In another series of NACA tests at extreme bearing pressures and sliding velocities, comparatively low friction coefficients and wear rates were obtained with hot pressed bearing material compositions of silver, copper and MoS_2, the best being 85 pct silver, 5 pct copper and 10 pct MoS_2.

While there are a large number of applications where the dry film application is preferable, grease film stores more MoS_2, adds protection against corrosion, serves better to transfer or spread frictional heat, and is easier to apply.

After several years of development work with hundreds of compounds, a mixture of grease consistency was finally developed and will soon be available for extreme bearing pressures.

Plating improved WITH

Greater plating speed and brighter deposits can be attained through use of a recently-introduced electroplating innovation. Although the principles of periodic reverse current plating, as the process is called, have been known for almost 40 years, it was only in recent times that the technique has gained commercial acceptance. Several patents have been issued on the process, the most recent of which are the Jernstedt patents No. 2,451,340 and 2,451,341, issued Oct. 12, 1948.

Briefly stated, the process combines plating and electrolytic polishing in the same operation; it permits the use of much higher current densities than can possibly be used with ordinary direct current plating. When the current is reversed, some of the deposit is redissolved. If the conditions of chemical balance, current density, and timing are correct, the reverse current acts as a smoothing agent by removing many surface imperfections. Pits are bridged over, burrs are rounded, and scratches are smoothed. In addition, edges do not build up as badly with periodic reverse as they do when ordinary plating methods are employed. Among the many advantages of periodic reverse plating is the fact that it permits the use of higher currents, thereby increasing the rate of deposition. Brightness is improved, and the method produces smooth deposits of close-grain structure up to a thickness of 3/16 in. Porosity is reduced, and the deposit is distributed with greater uniformity.

Plating and reversal currents with a plating time of 7.5 sec. and reversal time of 2.5 sec. are shown in Fig. 1. The curve is theoretical and does not show the loss of time required to accomplish switching by various contacting or generator field switching devices. This time loss, however, is very slight and for all practical purposes, negligible.

Improves Corrosion Resistance

The immediate question which arises is the apparent loss of plating efficiency: the plating cycle is not only interrupted during the reversal of current, but a substantial quantity of deposit is also redissolved, by deplating. The deposition therefore cannot possibly follow Faraday's Law, which states that 1 g equivalent of metal is deposited when 96,500 Coulombs of electricity is passed through a solution—assuming a current efficiency of 100 pct. Nevertheless, the loss of current efficiency due to the current reversal is more than compensated for by the reductions in time and in polishing costs. Also,

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REVERSE CURRENT TECHNIQUES

Periodic reverse current plating makes possible greater plating speed and smoother, finer-grained deposits. The process combines plating and electrolytic polishing in one operation, the current reversal reducing surface imperfections and holding edge buildup to a minimum. Brightness is also improved.

since pin holes and porosity are reduced to a minimum, greater corrosion resistance is possible.

A number of devices are available for producing periodic reverse current; these are generally divided into three classes. The first class embraces chronometrically-driven devices such as is shown in Fig. 2, which energize relays or other contacting devices to accomplish reversal. The total cycle is fixed from 10 to 15 sec, and only the reverse cycle is adjustable.

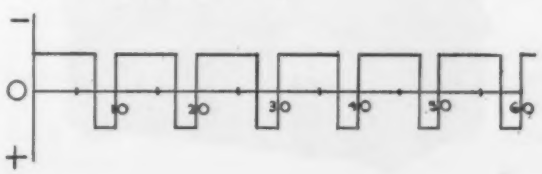
The second class is the electronic timing devices. These units employ two separate electron tube timing circuits so that both the plating and reverse cycles can be adjusted. The tubes are usually of the thyratron gas-filled type having very sharp cut-off current characteristics. Timing is accomplished by having a predetermined grid bias and then charging a condenser through a variable resistance. When the condenser is fully charged, it causes the tube to fire (conduct), acting as a short circuit across the condenser. The discharged condenser then starts recharging, and the cycle is thereby repeated. In order to vary the timing cycle, it is only necessary to vary the resistance; this increases or decreases the charging rate on the condenser. The two thyratron circuits are connected to small relays; these operate the master relay, which performs the actual reversing operation.

Timing devices which reverse the polarity in generator fields comprise the third class, and may be of the chronometric or electronic type. However, the relay need not be as large as those used for direct high current reversal, where the current source is a rectifier. This latter type should therefore be much more economical, since high amperage relays and magnetic contactors are rather expensive.

Has Broad Range of Uses

Cyanide-type plating solutions have been found the most suitable for periodic reverse plating. The method is used extensively for silver, copper, gold, brass, cadmium, zinc and tin plating. It can be used for any type of plating where the conditions of the solution and metal being plated permit a complete electrochemical reaction reversal. Such solutions as chromium and rhodium, which are plated from insoluble anodes, naturally are not suitable for periodic reverse plating. There is no reason, however, why the use of periodic reverse plating should be restricted to the cyanide group, since excellent results have been ob-

FIG. 1—Schematic diagram showing plating and reversal currents, with a plating time of 7.5 sec and reversal time of 2.5 sec. The curve is theoretical.



tained with copper fluoborate, copper sulfate, and many other types of acid solutions.

No positive statement can be made about timing. Cycles which are suitable for one type of solution and article are not suitable for others. A total cycle of from 10 to 15 sec and a reverse cycle of from ½ sec to as much as 5 sec can be used. Some timers are made with two cycle adjustments from 0 to 20 sec each, giving the user a wide choice of ranges.

The demand for electroplating on aluminum has been increasing, especially since it is now possible to plate the difficult No. 13 high-silicon diecasting alloy. A patent recently applied for by the author describes a process for preparing this material for plating—U. S. Patent Application No. 166,839, Docket No. 9222. In addition to being somewhat porous, this alloy is also very susceptible to corrosion. The periodic reverse current method is recommended for the purpose of sealing the pores and making the copper and nickel deposits impervious. Since the difference in potential between the base metal (aluminum) and the plated coating in the presence of moisture is tremendous, even the tiniest pin hole will cause a rapid breakdown. For this reason, any plated coating intended to protect aluminum must be substantially free from pin holes.

Smoother, More Uniform Plate

One of the most recent applications of periodic reverse current technique is for silver and copper plating on printed electronic circuits. These circuits are used in hearing aids, front-end tuners on television sets, and in radar and radio circuits in guided missles for military use.

The plating in these circuits must be of very uniform cross section and of considerable thickness. If plastic material is used as a base or chassis, an electrically conductive coating is printed directly on the plastic which binds itself firmly to the base material. Resistors, condensers, and inductances are then ingeniously printed (plated) into the circuit in steps. If glass is used, a silver mirror is deposited directly on the glass by chemical reduction. To plate these circuits by conventional methods would require from 2 to 2.5 times the time required with periodic reverse plating. Also, the quality of the periodic reverse plated surface is superior both in smoothness and in uniformity.

FIG. 2—Chronometric type laboratory model Ramyr periodic reverse current unit on which only the reverse cycle is adjustable.

Plates Radar Wave Guides

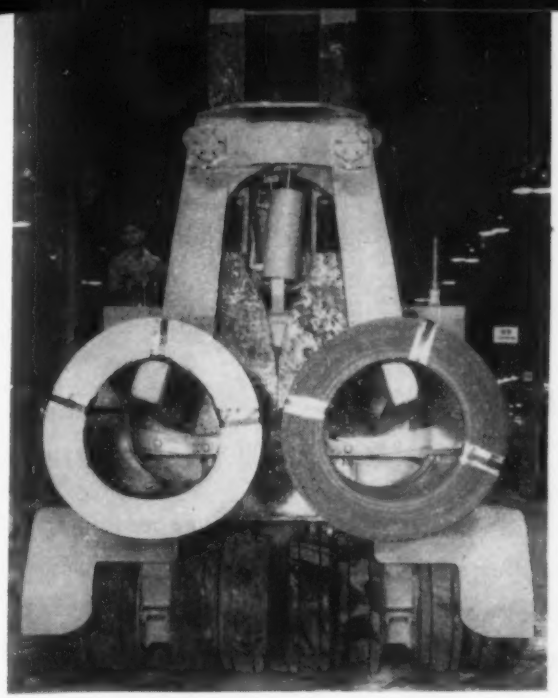
Another application used by a large aircraft manufacturer doing considerable electronic research work, is periodic reverse plating of wave guides for radar. These wave guides are made of aluminum and are first given a pretreatment. This makes it possible to plate on a thin film of copper, over which silver is plated to a thickness of about 0.001 to 0.0012 in. This is done in a special bath containing brighteners and considerably more silver than standard formulas call for.

After the silver is deposited, it emerges from the bath with a bright satin finish unlike the dull gray or yellowish nonmetallic-appearing finish produced by ordinary dc plating methods. However, silver tarnishes rapidly, so a flash or light plate of indium is applied. The indium may be diffused into the surface of silver by heating, thus protecting the silver from tarnishing. Other aluminum parts so plated and intended for electrical work may be stored for considerable lengths of time. They can be easily soldered, without the use of acid fluxes which, because of their corrosive effect, cannot be used in electronic work.

Permits High Current Density

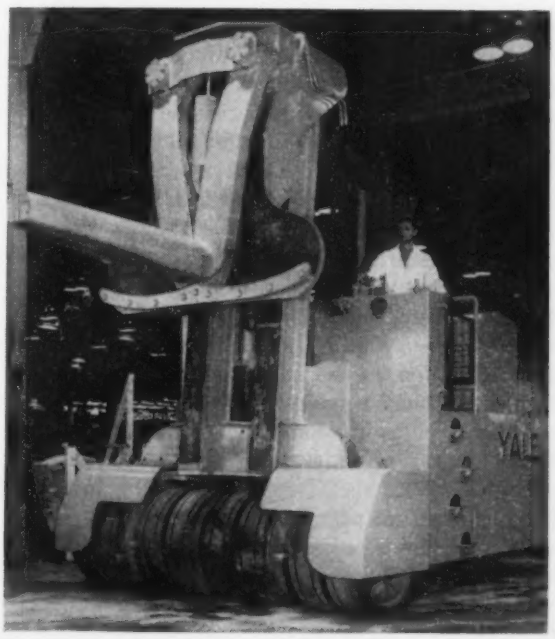
Many other useful applications will no doubt be found for periodic reverse plating. Much research work remains to be done in developing suitable brighteners, surface tension depressants and plating solution formulas which will lend themselves readily to the alternate oxidation and reduction reactions which take place. In connection with alkaline solutions, much progress has already been made, as for example the remarkable success obtained with modified bright high-speed copper solutions.

Considerable improvement is still desirable for using this type of plating in acid solutions, especially the acid fluoborates. Copper fluoborate shows considerable promise in this respect, since it is a high-speed process even without periodic reverse, capable of plating 1.5 to 2.0 times faster than copper sulfate—sulfuric acid solutions. When periodic reverse is applied to a copper fluoborate solution, extremely high current densities can be used with no apparent effect on the smoothness or other qualities of the deposit.



THIS IS the world's largest ram truck, which has made it possible to increase the weight of strip coils produced by Bethlehem Steel Corp., at Lackawanna, N. Y.

THE TAPERED, cast steel ram may be used for one big coil or split to handle several smaller ones. Dual controls permit the truck to be operated from either side of the cab.



A 165-HP diesel-electric unit powers the articulated wheels and driving mechanism of this new Yale & Towne ram truck.

40-ton ram truck

INCREASES YIELD AND PRODUCTION

With a capacity only two tons less than its 42-ton weight, the new, and world's largest, ram truck is already at work in the Lackawanna, N. Y., plant of Bethlehem Steel Corp. The truck is one of a new series being designed and manufactured by Yale and Towne Mfg. Co., Philadelphia, to meet the steel industry's need for equipment able to match the mile-a-minute pace of modern continuous strip mills.

The 15-ft high monster has made it possible to increase the size of coils produced in the Lackawanna mill from 40,000 to 60,000 lb, and this figure could be upped to 80,000 lb if necessary. The two new ram trucks now in service at the Bethlehem plant are handling strip 72 in. wide by 65 in. OD, 24 in. ID.

The new equipment's greater capacity is important, because until now it has been possible to roll strip faster than the mill could be fed or its products carried away. As much as 17 pct of the rolling time of a typical fast strip mill has been consumed by handling. Doubling the size of the coils produced increases yield as well as overall output. Ends of coils rolled while the mill is accelerating and decelerating are off-gage and must be rejected.

Trucks Will Work On Rough Floors

Plants having uneven floor surfaces will find the new truck able to retain equal wheel loading despite bumps and depressions. Both its front drive wheels and trailing wheels, which do the steering, are fully articulated. Safe, low-pressure hydraulic systems power both the fingertip-controlled steering mechanism and lifting equipment. The truck can be turned around in a 14-ft aisle.

Yale and Towne's new ram truck obtains its power supply from a 165-hp diesel-electric unit, of the same size used in a 25-ton locomotive. Dual controls make it possible to operate the unit from either side of the cab.

One big strip coil can be handled by the new ram truck's tapered cast steel ram or it can be split in two to take several smaller ones. Each half of the ram can be operated independently.

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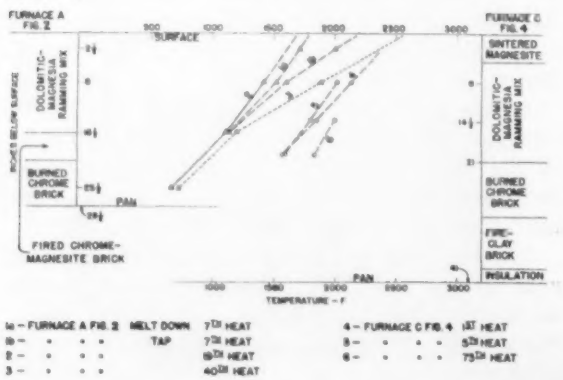
TEMPERATURES *of* openhearth bottoms measured

Part II: As a result of precise temperature measurements and core drilling of openhearth bottoms, better design, materials and methods are now possible. A type of hearth construction as a result of this project is suggested.

Temperature measurements in rammed portions of openhearth bottoms show not only the depth of ceramic set and possible strain present, but they also clearly depict the thermal gradients present. Some of these data were presented in Part I of this article. Other information contained here will help in designing better bottom construction.

Thermal gradients, mostly near tap time, in two hearths are given in Fig. 6. They show that after steelmaking has started, the subsurface layers are relatively cool; the gradient is extremely steep adjacent to the surface in Hearth A, Fig. 2, but the gradient in the remainder of this hearth is nearly parallel to the gradient found in Hearth C, Fig. 4. These gradients are not for steady-state heat flow, but for the high points in a cyclic variation in the inner layers. The displacement of the curves undoubtedly results from the hearth thickness and thickness of the insulation used. Thus the relief of the strain set up in the surface layer due to thermal contraction between the tapping of a heat and the charging of the next is confined to the hearth layer immediately below the surface. Since the temperature change may be as much as 2000°F, cracks may be present in each hearth after charging and in some cases a slab may split off parallel to the surface.

FIG. 6—Temperature gradients through rammed openhearth bottoms.



Temperature gradients through rammed openhearth bottoms.

The displacement of the temperature peaks at a level some 8 in. below the surface by some 3 to 5 hr after a heat was tapped illustrates the slow passage of heat through a hearth. If a surface layer has shelled off because of the thermal contraction during charging, this defect may not heal until after liquid metal is present on the surface. If the defect is beneath a large mass of lime, then, owing to the violent agitation, the entire surface layer may come loose and expose a cold surface to the action of steel, though the boiling action usually continues and it is difficult to determine whether boiling is from charged lime or action on the hearth. This type of bottom defect may be caused in part by strains set up during charging combined with the relatively low temperature which is present in the subsurface layers. This steep temperature gradient near the surface permits heats to be successfully worked on an essentially steel bottom covered by a few inches of dolomite providing they are kept on the cold side until near the end of the processing cycle.

Thermal Expansion Allowed For

A temperature of approximately 1800°F is reached at a level of 15 in. below the surface after steelmaking starts in relatively thick hearths, regardless of the hearth composition. In thinner, uninsulated hearths the temperature may be of the same order of magnitude only 8 in. below the surface while the temperature 12 in. below the surface may be of the order of 1300°F.

An expansion allowance for 3000°F must be provided for brickwork which is to serve as the base for a magnesite-slag surface but after steel

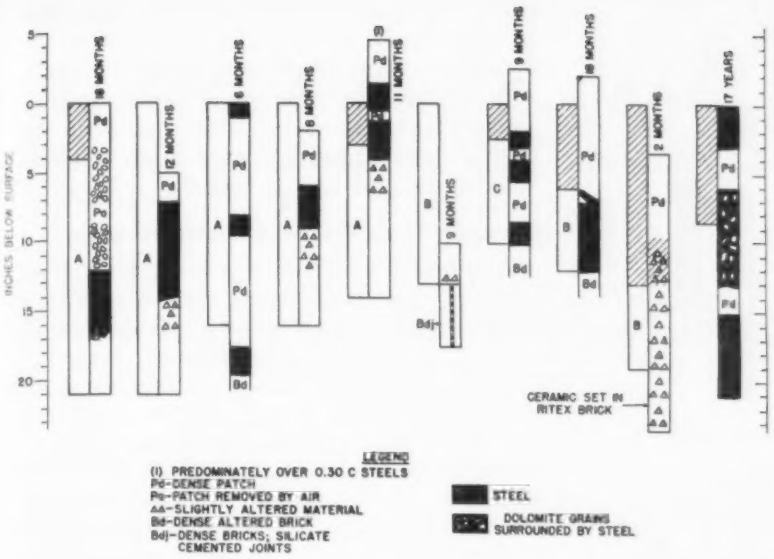


FIG. 7—Sketches showing original composition of different openhearth furnace bottoms and corresponding drill cores after limited service.

production is started the normal temperature is only 1300°F (15 in. below the surface). Since the expansion allowance has been made only to provide for thermal expansion, then upon cooling 1200°F the brick work will contract and voids will be present between the brick. This is especially true when magnesite brick, which have a high coefficient of expansion, are used.

One of the advantages of a rammed hearth would seem to lie in the fact that allowances for expansion in the brickwork need be made for only 2000°F and a tight brick subhearth should result during normal operations. If deep holes occur in in the hearth they will be of local nature and the compression of the brick owing to thermal expansion should aid in preventing steel from penetrating the joints. The weight of the metal bath has always been assumed to be sufficient to prevent the heaving of brickwork in the bottom.

Working Surface 10 in. Below Blueprint Level

No advantage has been shown by any one type of construction over the others as judged from drill core data as shown in Figs. 7 and 8. These data suggest that the working surface may often be as low as 10 in. below blueprint level when a hearth has been used chiefly to make steels under 0.20 pct C. The record lost time obtained on a new hearth is achieved by not replacing the original hearth material which is worn away through the action of the steel and slag. After the hearth becomes so low that maintenance material is added to the flat, the delay time increases and usually approaches the shop average three to six months after it has been installed. All types of bottom material have been eroded to about the same extent and for this reason we are skeptical of new products offered for use in our furnaces.

In Fig. 9 a suggested construction for a 41-in. deep hearth, based on these temperature measurements, as well as drill core data, is given. This hearth should be brought up to temperature in a manner governed only by the requirements for proper heating of a new silica roof and after reaching temperature, 5 in. of double-burned dolomite is to be burned on within 10 hr. The furnace should be held at temperature for only 1 hr or so and then slagged to seal the pores. The hearth should be given a 30-min chill to harden the hearth before the first heat is charged.

Fast Burning-in Recommended

This rapid burning-in schedule is suggested because no unfavorable results were noted after using this type of schedule, however, the type of bonds in one of the nearly pure magnesia ramming mixes may not be adaptable to this type of schedule. Drill cores failed to show any undue erosion in this type of hearth as compared to other furnaces which had been given much more extended heating and holding periods.

Drill cores have shown repeatedly that double-burned dolomite has sintered to a porous mass and during the succeeding heats owing to insufficient initial slagging, the voids between the grains were filled with steel. A good slag wash should aid in eliminating the pores near the surface of such a sintered mass. Another advantage of this sintered dolomite surface is its apparent ability to resist cracking during chilling. Cracks usually develop on all other preparations almost immediately after the flame has been shut off, but a sintered dolomite layer does not usually show cracks until a temperature of 2000°F is reached.

The rammed layer will prevent the brickwork from becoming too hot during the burning-in period when an expansion allowance for 2000°F is used. However, the 10-in. rammed layer and

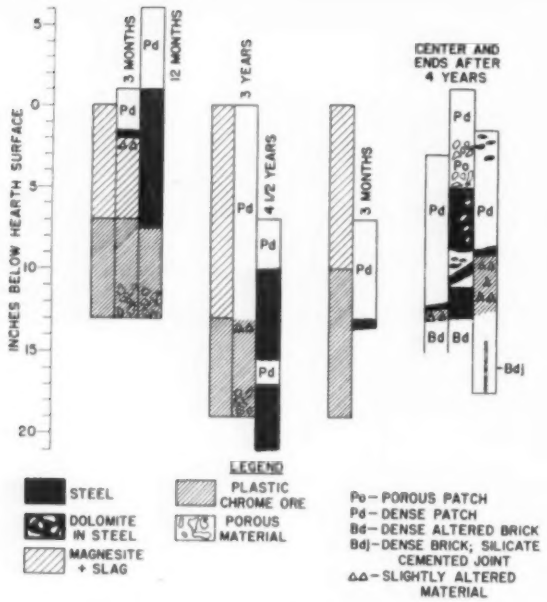


FIG. 8—Sketches showing original composition of open-hearth furnace bottoms with plastic chrome ore subhearths and corresponding drill cores.

the 9-in. underlying brick layer make potentially a 19-in. monolithic subhearth. The liquids from a rammed layer of magnesia base mix with high silicate content will drain downward to cement the rammed layer to the magnesite brick as well as seal the brick joints and the pores in the brick. Drill cores from one hearth of this type showed a segment where the rammed layer was ceramically bonded to the underlying unfired magnesia-chrome brick, Fig. 7. This ceramic bond extended throughout the upper 4½ in. thickness of the brick as well as between the brick.

Dense Brick Prevents Penetration

Dense magnesite brick should be used because one hearth was observed where steel had penetrated to the magnesite brick and a ⅛-in. thick fin of steel had penetrated 3 in. of the 9 in. soldier course. The brick adjacent to the metal was dense while that portion below the metal had the porosity of the normal magnesite brick. The use of a more dense brick should have minimized possible shrinkage of the brick while proper expansion allowances would also have been an aid in preventing steel from entering the brick work. The use of two 4½-in. rowlock courses would not seem to provide as great a protection against floating out of brick as does the 9-in. soldier course.

Chrome brick is suggested below the magnesite brick because of the tendency for magnesite brick to slate after standing for long periods of time. Several instances occurred in which silicate liquids coming from the overlying magnesite base materials had filled the voids as well as the brick joints to produce a monolithic mass of well sintered dense chrome particles during service.

The banks should be covered by a 1 to 2-in. layer of sintered dolomite prior to charging and in order to save furnace time the banks must be installed so that they have an angle of about 45° with the flat. If banks are steeper than this, a sintered layer cannot be burned-in with a minimum of time nor can the banks be dressed before or after the first heat is tapped.

Cheaper Than Plastic Chrome Hearth

This hearth should be less costly from several points of view than one prepared using a plastic chrome ore subhearth, although the core drilling (Fig. 8) shows this latter type of construction to have an excellent record in thinner hearths and it has stood up as well as other materials in thicker furnace bottoms. Drill cores taken 3 months after start of steelmaking showed that the upper 4 in. of a 6-in. thick layer was dense and that the entire layer was chemically intact. In addition, 4 in. of the original magnesite was still in place and chemically unaltered. After an additional 9 months of operation, this furnace was found to be giving considerable delays but upon core drilling a thick steel layer was found to overlie the subhearth material which was intact and chemically unaltered.

In a thicker type of hearth after 3 years of service, the upper 1 in. of the original material was slightly altered but only 4 in. of the 6-in. layer had been matured during the burning-in process. However, upon redrilling the hearth 1½ years later, this entire layer was missing although the underlying chrome brick had become ceramically bonded to form a dense mass.

Acknowledgment

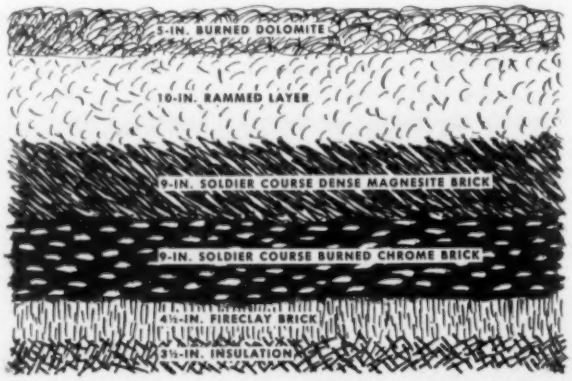
The author wishes to thank J. W. Bain, Dr. R. B. Sosman and John Topping for their work and help on this project.

References

1 *R. B. Sosman, "Temperatures in Openhearth Furnaces," T.P. 2435. AIME Metals Technology, 15, 1948.*

2 *Alwin F. Frantz, "Furnace Bottom Temperature Gradients," AIME Openhearth Proceedings, 1938, p. 17.*

FIG. 9—Recommended construction for openhearth bottoms.



news of industry

Taconite is Steel Industry's Ace-in-the-Hole

Once a stepchild, abundant low-grade taconite is subject of serious study . . . Two major projects under way on Mesabi . . . Beneficiation success means steel security—*By Bill Lloyd.*

Cleveland — Steel industry expansion to over 120 million annual tons by the end of 1952 (THE IRON AGE, Feb. 1, 1951, p. 121) can put a crippling strain on once-vast Lake Superior iron ore deposits and make American steelmaking vulnerable to war-cut supply routes and international misunderstandings that may result from heavy dependence on foreign iron ore.

Major Mesabi Projects

This underlines the importance of beneficiation of low-grade taconite ores as a means of preserving Lake Superior fields and providing a security supplement for foreign ore. The holdback now is perfection of methods to make beneficiation more feasible.

Two major projects for beneficiation of magnetic taconite are now under way on the Mesabi Range: Erie Mining Co., managed by Pickands, Mather & Co. for Bethlehem Steel and Youngstown Sheet & Tube; and the Reserve Mining Co., managed by Oglebay, Norton & Co. for Republic Steel, Armco Steel, and National Steel Corp.

Eugene Grace, Bethlehem president, said that Erie Mining may build a beneficiation plant at Aurora, Minn., to produce 2.5 million annual tons of usable ores. Hopes for this plant are based on encouraging progress with ores in the Northwest and Bethlehem experience in Cornwall, Pa., mines, where ores have been concentrated and pelletizing and sintering operations held. Erie Mining has for 2 years operated a pilot plant at Aurora.

National Steel recently acquired a 15 pct interest in Reserve Mining which controls iron ore deposits containing 1.5 billion tons of taconite at the eastern end of the Mesabi Range in Minnesota. A yield of 500 million tons of 60 pct iron ore pellets is expected. Reserve plans to install equipment to produce 300,000 tons of pellets a year.

After completion of the smaller plant, Reserve intends to build a one-unit plant to produce 2.5 million tons of pellets a year, docks and harbor at Beaver Bay, Lake Superior, two mining towns, and a 47-mile railroad, to cost about $60 million. Eventual construction of a plant with a 10 million ton capacity and a total investment of about $160 million is also planned.

Site of Future Facilities

U. S. Steel Corp. now has a washing and sintering plant at Virginia, Minn., using sub-marginal ore, 40 to 45 pct Fe, for a 60 pct Fe product. This plant may be the core of future taconite beneficiation.

Taconite experts hope some day to be able to beneficiate both magnetic and non-magnetic taconite. Magnetic taconite, which has the greater part of its iron oxide as magnetite, is so called because magnetic separation can be used on it. This method cannot be used yet with hematite or other types

Steel Scrap Rollback

New York—Based on a delivered Pittsburgh key price of $44 a ton for No. 1 heavy melting steel, new ceilings were placed on iron and steel scrap by the Office of Price Stabilization effective Feb. 7.

In commenting on the order, OPS Director Michael V. DiSalle said that although the regulation fixes prices at generally prevailing December levels, the month "is not being used as a base period necessarily reflecting general stability" and prices will be re-examined later. (For complete order and reaction of trade story see p. 136.)

Ceilings of the order are in force regardless "of any contract or other obligation" existing on the effective date of the regulation.

Electromet Buys Tungsten Ores

Pine Creek, Calif.—Purchase of low grade tungsten ores and concentrates will be made by Electro Metallurgical Div. of Union Carbide & Carbon Corp., according to H. L. McKinley, general superintendent, Pine Creek mine and mill.

Navy Planes Planned at Lustron

Washington — Government-owned facilities at Columbus, Ohio, scene of the ill-fated Lustron housing activities, will be turned over to the Navy Dept. on orders from the Defense Production Administration.

The plant will be used for manufacture of aircraft as soon as facilities can be installed, probably by mid-summer.

INDUSTRIAL SHORTS

DOUBLES CAPACITY — Plans for a 100 pct expansion of facilities of the Aeroproducts Div. of GENERAL MOTORS CORP., Dayton, Ohio, are completed. The construction of a new building at the rear of the present structure, will double the present manufacturing area, affording a total of over 500,000 sq ft of manufacturing, laboratory testing and office area.

CHAIRMAN SEATED—A. vanderZee, vice-president, Chrysler Corp., has been elected chairman of the sales managers committee of the AUTOMOBILE MANUFACTURERS ASSN., Detroit. Mr. vanderZee succeeds Wiliam F. Hufstader, vice-president in charge of distribution, General Motors Corp.

ELECTIONS — Eight warehouses joined the AMERICAN STEEL WAREHOUSE ASSN.: Bushnell Steel Products, Inc., Hialeah, Fla.; Cold Metal Products Co. of California, Los Angeles; W. L. Coston & Sons, Birmingham; August Feine & Sons Co., Inc., Buffalo; General Steel Co., Fort Worth, Tex.; Great Western Steel Co., Chicago; Murray-Baker-Frederick, Inc., New Orleans, and Precision Steel Warehouse, Inc., Chicago.

SIGNED AND SEALED — The Titanium Alloy Mfg. Div. of NATIONAL LEAD CO. has contracted for the purchase of the assets of the Hi-Alloy Castings and Tri-State Foundry Co. of Elwood City, Pa. The additional electric furnace capacity and ample power facilities of this plant is expected to augment present production of the Niagara Works of the division in Niagara Falls.

NEW SALES REP.—Rigidized Metals Corp. have acquired three new sales representatives; RUBERT J. WAGNER, Los Angeles; the DISQUE STEEL PRODUCTS CO., Indianapolis, and the ALDER STEEL PRODUCTS CO., Minneapolis.

BUSINESS IS GOOD — The H. K. FERGUSON CO., New York, industrial engineers and builders, entered 1951 with a backlog more than 50 pct greater than the previous year. The management disclosed that 1950 was the third best year in the company's 32-year history from a sales standpoint and that new business in 1950 tripled the volume of 1949.

DIVIDE DIVISION — The expansion of the Ingersoll Steel Div. has prompted BORG-WARNER CORP. to divide the division. The New Castle plant continues the name of Ingersoll Steel Div., while the Chicago and Kalamazoo plants are now known as the Ingersoll Products Div.

SELLS OUT—Purchase by the OHIO ELECTRIC MFG. CO., Cleveland, of all tools, patents and rights to manufacture the Taylor & Fenn line of drilling machines has been completed. The Taylor & Fenn Co. was established in 1846 and is one of the country's pioneer machine tool builders.

MORE POWER — The BALDWIN - LIMA - HAMILTON CORP., Philadelphia, has completed arrangements with the Electric Light & Power Plant of Weatherly, Pa., for the delivery of a 1000 kw diesel engine generating unit to supplement the present steam power because of increasing industrial needs.

SIX NEW GENERATORS — STONE & WEBSTER ENGINEERING CO., Boston, has been contracted by the Chelan County Public Utility, Washington district, to construct a $26,000,000 power facilities plant at Rock Island Dam on the Columbia river. An agreement between the Puget Sound Power & Light Co. and the Public Utility district was reached to add 135,000 kw with six new generators.

of taconite because the iron minerals are non-magnetic.

The big problem in beneficiation is agglomeration. Taconite can be broken down with crushers and ball mills, and the iron taken out with separators. But pelletizing is harder than was supposed.

Flotation Method

Experts believe that with low-cost natural gas for heat, non-magnetic taconite can be made susceptible to magnetic treatment by conversion of its oxides to magnetite. The cost factor is big.

Several companies have been using flotation which would have priority over roasting because of lower cost. Some figure that six or seven times as many workers will be needed to produce one carload of taconite concentrate to a carload of open pit free shipping ore. Offsetting factors are taconite's abundance and low tax rate.

Plant capacity costs have been estimated at from $15 to $20 an annual ton, depending on what dock and rail facilities are required. Costs would decline later. It is believed that foreign ores can compete with taconite as far West as Pittsburgh. By a rough rule, taconite concentrate costs about three times as much as open pit ore and one-third more than underground. The only fair comparison, though, is by an iron unit basis.

Backed By Cash

Recently, E. W. Davis, director of the Mines Experiment Station, University of Minnesota, published a figure of $9.24 as a total cost of a ton of taconite pellets delivered to lower lake ports. Lake Erie price 64 pct Fe dry, 62.5 pct Fe natural x $0.15243 (the unit price) yields $9.53, indicating a profit of .29 cents per gross ton.

The steel industry's conviction that taconite beneficiation must work is being backed with cash.

Start Joint Aircraft Agency

Washington — The Munitions Board has established an Aircraft Production Resources Agency at Wright-Patterson Air Forces

Base, Dayton, Ohio. The new agency will act as a joint Army-Navy-Air Force organization for the military services and the aircraft industry.

Acting in the place of the former Aircraft Scheduling Unit of the Munitions Board, the agency will expand former duties and consolidate requirements for materials and other resources needed in the combined military aircraft and associated programs.

NPA May Allocate Moly Soon To Fight Cutting Tool Pile-Up

Washington—An allocation system for molybdenum, similar to that for tungsten, was a definite probability this week.

Major reason is order backlogs for tool and other high-speed steels are piling up and manufacturers are in the middle. Tungsten suppliers have been ordered to cut deliveries to 20 pct of requirements (M-33) while molybdenum inventories have been cut to 20 days and shipments to 50 pct of requirements.

Manufacturers of cutting tools tell NPA orders for both defense and supporting programs have jumped. For instance, tool steel requirements for hack saw blades and metal cutting band saws have increased by a third, largely in sizes not normally required.

Representatives of these industries have requested NPA to permit them to increase inventories from the 45-day to a 90-day limit. They estimate requirements for 1951 will be about 8000 tons.

Forge-Tapered Wing Spars

Pittsburgh—Successful experimental fabrication of forge-tapered aluminum wing spars was announced by the McDonnel Aircraft Corp. and Aluminum Co. of America. The new method provides a bulb of aluminum in the web of what otherwise is an I-beam type of extrusion. The extrusion is then forged so that the bulb is progressively flattened and the web tapers from 10 in. at one end to about 15½ in. at the other.

Powder Metallurgy May Offset Metals Cuts

Auto appliance cutbacks may make available powder metallurgy capacity . . . Powder metal parts eliminates much-machining, can free machines for defense work—*By Walter Patton.*

Detroit — Many metalworking firms caught by recent restrictions placed on copper, tin, aluminum and other strategic materials may find powdered metal parts an answer to their production problems.

For the next few months, cutbacks in auto and appliance production are expected to make available a substantial amount of capacity in the fast-growing powder metallurgy industry.

Product Range Broadens

Industry sources report that for the present at least the supply of iron powder will meet anticipated demands of industry. However, if present experimental work results in adoption of iron powder rotating bands for shells capacity will have to be greatly expanded.

Since the end of World War II, the powder metal industry has made tremendous forward strides, and the number of products produced from metal powders has broadened. Whereas most products made with this method 5 years ago weighed only a few ounces, parts weighing 5 lb or more are now being made. Dimensional obstacles have also been removed. Parts 18 in. in diameter have been formed successfully.

Another advantage of specifying powder metal is the elimination of a large volume of machining. Redesigning of intricate machine parts for powdered metal production often eliminates broaching, milling, drilling, facing or other operations, thereby freeing a considerable amount of machine capacity for defense purposes.

Big backlogs reported by machine tool producers may also turn many production engineers

Steel Company Earnings—1950 and 1949

Company	Fourth Quarter '50	Fourth Quarter '49	1950 12 Months	1949 12 Months
U. S. Steel	$36,516,115	$32,735,397	$215,337,655	$165,908,829
Bethlehem Steel Corp.	32,171,657	16,385,137	122,976,071	99,283,539
Republic Steel Corp.	7,410,093	10,794,449	63,794,711	46,142,323
Jones & Laughlin Steel Corp.	13,263,000	922,000	39,744,000[2]	22,248,000
Youngstown Sheet & Tube Co.	11,394,492	3,219,020	40,616,403	31,777,010
Armco Steel Corp.	8,256,886	7,325,371	46,000,000	30,018,415
Inland Steel Corp.	5,930,414	1,171,070	38,015,676	25,013,707
Sharon Steel Corp.	.....	.....	9,284,643	3,325,964
Wheeling Steel Corp.	4,646,050	371,968[5]	18,314,517	7,896,265
Colorado Fuel & Iron Corp.	2,032,721	823,004[5]	4,578,332[1]	[1]591,828
Alan Wood Steel Co.	928,362	420,668	2,546,902	2,255,840
Thomas Steel Co.	.....	.....	929,945[4]	1,135,070
Kaiser Steel Corp.	.....	.....	4,322,792[3]	.....
Keystone Steel & Wire Co.	2,300,123	2,141,051	3,138,188[1]	[1]3,557,248
Granite City Steel Co.	5,727,405	.....	5,727,405	2,958,108
Pittsburgh Steel Co.	.....	.....	7,000,000[6]	844,810

(1) 6 months
(2) Preliminary
(3) Includes $852,000 non-recurring net profit
(4) 9 months
(5) net loss
(6) Tentative

in the direction of powder metallurgy, the trade believes.

Other Advantages Seen

For example: A product badly needed for defense was recently placed in production in 6 weeks using powder metal. Estimates placed the waiting period for new broaching equipment at 18 months.

Metallurgists point out the advantages of using powder metals are not confined to greater freedom of design, a wider choice of materials and elimination of machining operations. Other potential advantages include: (1) Quieter operation in service, particularly in the case of gears, pump parts and business machines; (2) Savings in assembly cost; (3) Reduced overall cost and (4) Greater production per sq ft of floor space.

Steel Importers Seek Price Freeze Relief

Try to drive out foreign steel hustlers . . . Meet in Washington this week . . . New Institute claims established importers were frozen at low voluntary price control period.

New York—Established steel importers are trying to drive out the hustlers who smelled a gold rush in foreign steel and jumped into the business with little knowledge but with an ambition to profit. They met in Washington this week with Economic Stabilization Agency officials to convince them to work some relief into the price freeze law so that the importers can stay in business.

The importers claimed that they were playing it above the table and in complying with a voluntary price freeze request 2 months ago held back markups. Thus the freeze caught them with their prices at a patriotic minimum while the speculators were playing the sky's the limit and can now continue operations with nearly the same profit margin.

Backs Against the Wall

Under the newly-formed American Institute of Imported Steel, 115 Broadway, New York City, steel importers charged that they faced ruin because the steel they could order now would have to be delivered months later at prices much above those of their low base period. Meanwhile, the hustlers could afford to pay high prices and could throw out a dragnet for nearly all foreign steel business.

The established firms, who claim that they do 95 pct of the importing in normal times, will then sit impotently on the sidelines—unable to buy because their dollars are tied by the freeze. Inflation would also be furthered because while most of the steel was being sold by established importers before, it may now get into less scrupulous hands. Result would be a great deal more foreign steel going at higher prices.

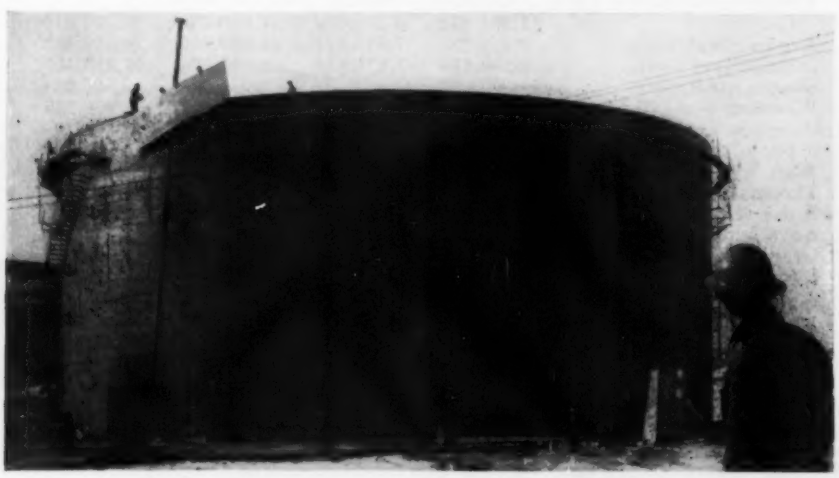
The steel import hustlers are a product of the steel shortage and high civilian demand. Smaller manufacturers had a willing ear for the traveling salesman of some line unrelated to steel who happened to discover a steel mill in Belgium or some other place that could ship so many tons of cold-rolled sheets. The prices of course were "understandably" terrific but the manufacturer was faced with balking on contracts and cutting down production.

With Little Knowledge

Some of these speculators knew absolutely nothing about steel and when they caught something they thought good, they started quick research to find out just what kind of steel it was. Others acted as contact men, investing little or no money. They merely found a firm that needed steel and guaranteed purchase, risking nothing except their consciences.

President of the new Institute is Nicholas Schilling, Amerlux Steel Products Corp. Vice-presidents are: L. J. Falling, Ovington Steel, Inc., and Henry Hack, Industrial Sales Corp.

COLD WEATHER INSURANCE: When cold winds blew and the supply of natural gas was curtailed, U. S. Steel Corp. switched its openhearth furnaces to fuel oil with the aid of this 4 million gal storage tank recently completed at the Duquesne Works. Furnaces are equipped for emergency conversion to oil.



Seek Pool Orders for Tools

Washington—The National Production Authority is stepping up its preparations for issuing pool orders for machine tools.

Probably the first segment of the industry to be affected will be the makers of vertical and hori-

zontal boring machines as well as the planer type milling machines. This was evident last week after a meeting of officials of the boring machine industry with NPA officials.

Industry representatives said that they are now already booked far ahead for some types of boring machines. In addition, they are having trouble getting materials such as castings of machine tool grade and manpower problems are beginning to be felt.

In view of increased demands expected as industry expands to meet defense production needs, pool orders are seen as helping the machine tool industry make advance scheduling. Spokesmen also indicated that they may ask for certificates of necessity (for fast tax write-offs) for their own expansion plans.

Tinless Cans Stitch in Time for NPA Cuts

Canco discloses tin-saving methods with tinless cans and new soldering methods . . . May take the edge off 20 pct tin cut . . . Tin free solders and plastic cement used.

New York—American Can Co.'s "Operation Survival" has unearthed means to slash tin use in metal containers with development of tinless cans and new seam-soldering methods. The news comes as a stitch in time following NPA's recent 20 pct cut in civilian tin use.

W. C. Stolk, executive vice-president, said that Canco's project, seeking American independence from foreign sources of can making materials, will soften the impact of tin restrictions on can making, customer industries, and consumers. The effects of the cuts will be as serious as the in-industry's capacity to produce tinless cans, he continued.

Breakdown of Methods

Progress of "Operation Survival" was listed as follows:

(1) Cans have been made of tinmill blackplate and low tin-bearing solder at speeds comparable to tinplate can output.

(2) Cans have also been made with tin-free solders which may be turned to universal use.

(3) Tinless cans have been made with a special plastic cement for side seams instead of solder. These cans are now being tested by several packers of oil and anti-freeze.

The NPA tin order assured adequate supplies for perishable foods containers but put many commercial products on the tinless black iron can basis. Canco's new processes will have the most immediate application to these. A stumbling step before had been in soldering side seams on tinless cans but now Canco seems to have overcome the obstacle.

Organic Coatings Goal

"Operation Survival" has another goal, that of discovering organic plate coatings from materials available on this continent. Canco has put a corps of scientists on the project to work full time in conjunction with over 20 firms who are possible suppliers of substitute numerous can making materials.

"It's right there in the bottom bin, Al."

"An Irreducible Minimum"

Mr. Stolk also said that the can industry has under its own "austerity" program cut tin usage down to the bone. In 1941, it used 41,000 gross tons of tin to make 25 billion cans and in 1950 used only 31,000 tons to make 33 billion cans. Thus the industry is faced with paring away 20 pct of tin supplies from "an irreducible minimum." Without the advent of tinless can on a commercial basis this feat would probably be impossible.

Revise Building Estimate for '51

New York—F. W. Dodge Corp. has revised upward previous estimates of 1951 construction volume and nature. Dodge now expects a total decline of 18 pct rather than 19 pct from 1950 volume and anticipates that limitations on commercial building will be offset by increases in manufacturing plant, power plant, direct military and civil defense construction projects.

Build Big Ford Ore Carrier

Detroit — A 647-ft ore carrier, the William C. Ford, will be built by Great Lakes Engineering Works for Ford Motor Co. The 19,000 ton vessel will be powered by a 7000 hp oil-fired turbine. Construction of three other ore carriers and a large ice-breaker for use in Mackinac Straits has also been announced.

Men for Fairless Works

Pittsburgh—U. S. Steel's Fairless Works now has top bracket operating personnel. They are Albert J. Berdis, general superintendent of the proposed plant; Henry E. Warren, Jr., assistant general superintendent; and Forest J. Smith, assistant to the general superintendent.

CONTROLS *digest*

For more details see "You and Government Controls," The Iron Age, Jan. 4, 1951, p. 365. For full text of NPA regulations write U. S. Dept. of Commerce, Division of Printing Service, Room 6225 Commerce Bldg., Washington 25, D. C.

Subject	Order	Effective Date
General		
Inventory Control	NPA Reg. 1	Sept. 18
	Interpretation 1, 2, 3,	Nov. 10
Priorities System	NPA Reg. 2	Oct. 3
DO Rating	Amend. 1	Oct. 3
DO Rating	Amend. 2	Dec. 29
DO Ratings	Delegation 1, 2, 3, 4	Nov. 1, 2, 3
Priorities (Canada)	NPA Reg. 3	Nov. 8
Hoarding	NPA Notice 1	Dec. 27
Auto Prices, Wages	ESA Reg. 1	Dec. 18
Ceiling Price Regulation	CPR 1	Jan. 26
Military supplies	Supplement 1	Feb. 1
Wage Increases	CPR 2	Feb. 9
Coal Prices	CPR 3	
Metals		
Aluminum distribution	NPA M 5	Oct. 27
Aluminum cutback	NPA M 7 (amended)	Feb. 1
	Direction 1	Nov. 28
	Direction 2	Dec. 16
	Direction 3	Dec. 27
Aluminum scrap	NPA M 22	Mar. 1
Cadmium	NPA M 19	Jan. 1
Cobalt stocks	NPA M 10 (amended)	Dec. 30
Collapsible tubes	NPA M 27	Jan. 27
Columbium steels	NPA M 3	Oct. 19
Copper distribution	NPA M 11	Nov. 29
Copper use	NPA M 12 (amended)	Dec. 30
Copper readjustment	M-12 Direction 1	Feb. 1
Copper scrap	NPA M 16 (amended)	Jan. 1
Molybdenum cutback	NPA M 33 (amended)	Feb. 2
Nickel cutback	NPA M 14 (amended)	Jan. 23
Ores, metals	NPA Del. 5	Dec. 18
Steel	NPA M 1 (amended)	Jan. 22
Freight car program	Supl. 1	Oct. 26
Great Lakes ships	Supl. 2	Nov. 15
Canadian freight cars	Supl. 3	Dec. 15
Steel scrap	NPA M 20 (amended)	Jan. 29
Steel warehouses	NPA M 6 (amended)	Nov. 15
Tin inventories	NPA M 8	Jan. 9
Tinplate, terneplate	NPA M 24	Jan. 27
Metal cans	NPA M 25	Jan. 27
Tinplate closures	NPA M 27	Jan. 27
Tungsten	NPA M 30	Jan. 22
Zinc distribution	NPA M 9	Nov. 16
Zinc cutback	NPA M 15	Jan. 15
Miscellaneous		
Chemicals	NPA M 32	Jan. 23
Construction	NPA M 4	Oct. 27
	Amend. 1	Oct. 13
	Amend. 2	Nov. 15
Elec. components	NPA M 17	Oct. 18
Iron, Steel Scrap Prices	OPS	Feb. 7

Controls This Week

NPA Orders

M-5, Aluminum distribution Amendment—Establishes new limits on DO orders for producers and fabricators based on average monthly shipments during first 8 months of 1950. Effective Feb. 1.

M-7, Aluminum cutback, as amended—Further curtails the use of aluminum in consumer goods. Effective Feb. 1.

M-12, Copper use, Direction 1—Permits readjustment of base period where operations were shut down 15 days or more during first half of 1950.

M-16, Copper scrap, as amended—Foundries and other producers are permitted to melt and process copper scrap generated in their own plants. Effective Jan. 31.

Wage and Price Orders

CPR-1—General price freeze. Effective Jan. 26.

CPR-1, Supplement 1—Exempts certain strategic supplies and services from the general price freeze. Effective Feb. 1.

CPR-2, Wages — Permits 15-day catch period for wage increases agreed upon before Jan. 25.

CPR-3, Coal prices—Permits adjustments in coal prices to coal wage increases.

CPR- . . . Iron and steel scrap price schedule, effective Feb. 7. Puts ceilings on scrap prices.

English Tractor Output Up

London—Farm tractor production last year was 53,000 units, of which 20,000 went to domestic users. Home buying rose during 1950 after a slow start.

Exempt Many Military Items From Price Freeze Restrictions

Much materiel and services are included . . . In effect until Apr. 1.

Washington — Supplementary CPR 1, exempting all commodities and services peculiar to military needs from the general freeze imposed by CPR 1, was signed late last week by Price Director Di-Salle. It remains in effect until Apr. 1 to provide time to study whether the items exempted should be more limited in scope.

In effect, it exempts most commodities (and their components, but not the raw materials therefore) sold to a defense agency or defense contractor for strictly military use.

The list includes: aircraft, ammunition, artillery, weapons, gas masks, mines and mine sweeping equipment, rockets, small arms, ships, torpedoes, grenades, parachutes and similar items.

Services Included

Nor do the ceiling prices apply to a broad list of services. These include repairs and maintenance of vessels, stevedoring, servicing and maintenance of aircraft, construction services, and research.

It exempts emergency sales and services to defense agencies provided a report of such sale is filed with the director of price stabilization giving details of the transaction.

Reason for the exemptions is that specifications and production plans for such goods are subject to frequent change. Since most of them are peculiar to the military, defense agencies are seen as best controlling prices, in addition, most contracts are subject to renegotiation to eliminate excess profits.

J&L's Dupka Named ESA Consultant

Washington—Walter H. Dupka, vice-president and a director of the Jones & Laughlin Steel Corp., has been named an iron and steel consultant to the Economic Stabilization Agency.

Aluminum Cutback Extended; Defense Orders Get Bigger Share

Take 45 pct of primary production ... Cut use in 200 consumer items.

Washington — Amendments to NPA orders M-5 and M-7, issued last week, require producers and fabricators of aluminum to take larger percentages of rated orders and prohibits use of aluminum for manufacture of more than 200 end items.

Establish Limit

Effective immediately, under the amended M-5, the ceilings on DO orders for producers and fabricators are now as follows, based on average monthly shipments during the first 8 months of 1950:

Sheet (coiled and flat), plate, circle and blanks, 40 pct; extrusions and tubing, 45 pct; rolled shapes, 30 pct; rod, bar, wire and cable, 35 pct; forgings and pressings, 60 pct; secondary ingots, 45 pct, and all other mill products, each 40 pct.

However, producers of primary and secondary aluminum are not required to take rated orders in any one month totaling more than 45 pct of scheduled primary production for that month. Nor must fabricators take more rated orders than 45 pct of their average shipments for the first 8 months of 1950.

The 60-day lead time remains unchanged, and there has been no increase in the 25 pct ceiling on rated orders for jobbers and distributors.

Effective Apr. 1, Amend 2 to M-7 prohibits the use of aluminum in the manufacture of more than 200 end items specified in List A. Items started before Mar. 31 must be completed before May 31. Effective June 1, use of aluminum for decorative or ornamental purpose is banned.

Included in List A are the following items which may not be made after Apr. 1:

Residential type roofing and siding, automobile hardware, wire fencing, metal lath, store fronts, domestic laundry accessories, furniture and furniture hardware, varied types of foil, storm windows and venetian blinds, wheelbarrows, flag and tent poles, screening (except insect), garden tools, and many other items.

PIDGEON HOLE PARKING: A new parking system developed by Pidgeon-Hole Parking, Inc., and installed at Spokane, Wash., will use large tonnages of structural steel. A mobile hydraulic elevator picks up the car, travels along a 19½ ft corridor, deposits the car in the right place, and returns. Operation takes from 45 to 60 seconds. Fifty-five units with capacity of more than 80,000 cars are scheduled for installation in Los Angeles County.

Granite Steel Buys Koppers Plant

Granite City, Ill.—The Missouri-Illinois pig iron and coke plant of Koppers Co., Inc., has been purchased by Granite City Steel Co. Adjacent to the Granite Steel works, the property includes: one 600-ton and one 500-ton blast furnace, a 49-oven coke battery, and related equipment for pig iron production.

John N. Marshall, Granite president, assured St. Louis area foundries and fabricators that the sale of pig iron will continue.

Copper Scrap Order M-16 Eased

Washington—Under an amendment to the copper alloy order (M-16), miscellaneous producers such as foundries are now permitted to melt and process copper scrap generated in their own plants.

The amended NPA order also permits them to accept from dealers the types of scrap named in the order for melting and processing, provided the materials are needed for their own production.

Inland Steel Opens Ore Mine

Chicago—A new iron ore mine will be opened by Inland Steel Co. It lies 2 miles east of Crystal Falls, Mich., and will be called the Cayia Mine for A. J. Cayia, Inland's manager of ore mines and quarries and head of the Inland Lime and Stone Co. Development of the mine will start immediately. Production is expected late in 1952. Eventual production of 200,000 annual tons is hoped for.

Ore will be shipped from Chicago and North Western docks at Escanaba, Mich.

Inco Makes Peak Nickel Shipments

Copper Cliff, Ont. — International Nickel Co., Inc., delivered 256 million lb of nickel in all forms last year. Deliveries in 1949 totaled 209,292,257 lb. Sales of all Inco products in 1950 amounted to $228 million as compared to $182,806,452 for 1949.

The firm reported current nickel output as being at maximum capacity and is expected to increase this year. Inco expects to complete by 1953 its project of fully converting from surface to underground mining. This has taken the bulk of Inco's $100 million in capital expenditures over the past decade and was motivated by diminishing open pit ores.

Coal Price Ceilings Permit Adjustment for Mine Pay Increase

Special anthracite regulation gives 90¢ a ton increase over Jan. 2 level.

Washington—Immediately after authorizing a catch-up period for wage increases agreed upon before the Jan. 25 wage freeze, the Office of Price Stabilization began work on an order allowing adjustment in coal prices to meet the $1.60 a day wage increase granted the miners.

As issued last week, CPR (ceiling price regulation) 3 set ceiling prices on bituminous, lignite and Virginia anthracite for mines east of the Mississippi at the highest price received between July 1, 1948 and June 30, 1949 or in the period Jan. 1-15, 1951. Ceilings for mines west of the Mississippi would be the highest prices charged between Mar. 1, 1950 to Jan. 15, 1951.

CPR-3 also provides these ceilings may be increased by the amount of additional cost resulting from the recent wage agreement. This was estimated as averaging about 25¢ per ton, varying from mine to mine.

A special regulation was issued covering Pennsylvania anthracite. Its effect is to remove anthracite from the general freeze order and establish specific prices, permitting a 90¢ a ton increase over Jan. 2 price levels.

Industry Objects

Industry members of the Wage Stabilization Board were united in opposition to a grace period.

Regulation 2 permits wage increases agreed upon prior to Jan. 25 to be granted provided such increases were scheduled to take effect by Feb. 9. The grace period also allowed arbitrated wage hikes and intraplant pay "adjustments."

Federal, state and municipal pay increases, fixed by statute, as well as increases necessary to bring pay up to establish minimum wage standards are exempt from the order.

The coal price order was seen as setting a pattern for other adjustments in prices. Officials of the OPS said the grace period would probably affect as many as 500 labor contracts.

November Finished Steel Shipments

As Reported to the American Iron & Steel Institute

STEEL PRODUCTS		Current Month					To Date This Year				
		Carbon	Alloy	Stainless	Total	Percent of Total Shipments	Carbon	Alloy	Stainless	Total	Percent of Total Shipments
Ingots	1A	69,132	12,611	1,294	83,037	1.4	649,763	114,165	15,325	779,253	1.2
Blooms, slabs, billets, tube rounds, sheet bars, etc.	1B	181,662	43,925	944	196,531	3.2	* 1,577,893	398,245	9,147	* 1,985,285	3.0
Skelp	2	4,858	-	-	11,858	0.2	112,069	-	-	112,069	0.2
Wire rods	3	0,807	1,473	390	72,670	1.2	737,224	14,154	1,395	752,773	1.1
Structural shapes (heavy)	4	32,673	6,596	6	389,275	6.4	3,790,518	41,434	147	3,832,119	5.8
Steel piling	5	37,416	-	-	37,416	0.6	308,350	-	-	308,350	0.5
Plates	6	510,809	88,334	967	540,110	8.9	4,937,750	175,904	10,543	5,124,197	7.8
Rails—Standard (over 60 lbs.)	7	118,576	18	-	118,594	2.0	1,572,832	329	-	1,573,161	2.4
Rails—All other	8	11,995	118	-	12,113	0.2	108,259	180	-	108,439	0.2
Joint bars	9	9,677	-	-	9,677	0.2	105,035	-	-	105,035	0.2
Tie plates	10	33,243	-	-	33,243	0.5	385,885	-	-	385,885	0.6
Track spikes	11	10,094	-	-	10,094	0.2	127,961	-	-	127,961	0.2
Wheels (rolled & forged)	12	28,704	26	-	28,730	0.5	237,690	123	-	237,813	0.4
Axles	13	14,198	53	-	14,251	0.2	112,230	565	-	112,795	0.2
Bars—Hot rolled (incl. light shapes)	14	502,186	165,900	2,730	670,776	11.1	* 5,472,066	1,787,401	*24,749	* 7,284,216	11.1
Bars—Reinforcing	15	152,405	-	-	152,405	2.5	1,521,938	260	-	1,522,198	2.3
Bars—Cold finished	16	105,820	24,130	2,900	132,850	2.2	1,220,963	230,108	27,147	1,478,218	2.3
Bars—Tool Steel	17	1,931	7,421	-	9,352	0.2	16,112	63,482	-	79,594	0.1
Standard pipe	18	214,240	113	2	214,355	3.5	2,366,758	452	16	2,367,226	3.6
Oil country goods	19	111,449	16,224	-	127,673	2.1	1,332,643	202,983	-	1,535,626	2.3
Line pipe	20	217,881	131	-	218,012	3.6	3,185,477	197	-	3,185,674	4.9
Mechanical tubing	21	46,921	19,173	353	66,447	1.2	477,809	191,038	3,282	672,129	1.0
Pressure tubing	22	19,432	1,456	422	21,310	0.4	195,385	21,709	6,767	223,861	0.3
Wire—Drawn	23	263,459	3,482	1,992	268,933	4.4	2,562,340	35,284	*18,679	* 2,616,303	4.0
Wire—Nails & staples	24	74,658	-	2	74,660	1.2	804,965	-	72	805,037	1.2
Wire—Barbed & twisted	25	19,898	-	-	19,898	0.3	215,468	-	-	215,468	0.3
Wire—Woven wire fence	26	39,631	-	-	39,631	0.7	445,992	-	-	445,992	0.7
Wire—Bale ties	27	8,113	-	-	8,113	0.1	76,040	-	-	76,040	0.1
Black plate	28	53,240	-	-	53,240	0.9	504,552	-	-	504,552	0.8
Tin & terne plate—hot dipped	29	154,595	-	-	154,595	2.6	1,747,568	-	-	1,747,568	2.7
Tin plate—Electrolytic	30	221,407	-	-	221,407	3.7	2,603,863	-	-	2,603,863	4.0
Sheets—Hot rolled	31	627,883	27,606	1,854	657,143	10.9	6,829,519	261,392	24,971	7,095,882	10.9
Sheets—Cold rolled	32	733,266	11,639	8,318	753,223	12.4	8,291,962	102,676	98,005	8,492,643	13.0
Sheets—Galvanized	33	163,633	1,350	-	164,983	2.7	2,064,305	23,847	-	2,088,152	3.2
Sheets—All other coated	34	19,136	-	-	19,136	0.3	212,683	-	-	212,683	0.3
Sheets—Enameling	35	18,570	-	-	18,570	0.3	235,139	-	-	235,139	0.4
Electrical sheets & strip	36	11,188	48,922	-	60,110	1.0	97,516	549,835	-	647,351	1.0
Strip—Hot rolled	37	191,517	4,412	420	196,349	3.2	2,070,645	41,616	6,781	2,119,042	3.2
Strip—Cold rolled	38	154,547	2,275	13,653	170,475	2.8	1,545,342	15,777	155,582	1,716,701	2.6
TOTAL		5,587,710	427,388	36,047	6,051,145	100.0	*60,860,529	4,253,176	402,608	*65,516,313	100.0

During 1949 the companies included above represented 99.4% of the total output of finished rolled steel products as reported to the American Iron and Steel Institute.

* Revised.

Building Booms Despite Curbs

Washington — Despite governmental ban on some types of construction, dollar volume of building activity for January boomed to a fifth more than for last year, Commerce Dept. figures show. A total of $2.1 billion went into place.

Industrial construction amounted to $125 million, compared with $69 million last year—an 80 pct increase.

Despite credit curbs, residential construction continued at a record level of $900 million for the month, a fifth higher than last year. Military construction was up to $25 million, three times the amount for January 1950.

White Starts ESC Program

Cleveland — Formation of an Emergency Service Corps program by the White Motor Co. to keep White trucks and buses rolling during the national emergency has been announced by J. N. Bauman, vice-president.

First phase of the program calls for registration of all White equipment in the United States. The program will aim to keep available White parts on hand in localities where needed.

Twin Coach Gets Bus Order

Kent, Ohio—One of the largest single bus orders ever awarded has been received by the Twin Coach Co. from the Army for production of 1650 transport buses. Total cost is $21,450,000.

Design is similar to a basic combination coach and cargo carrier developed by L. J. Fageol, president of Twin Coach.

Appliance Sales Volume Leaps

Chicago — Factory sales of standard size household washers totaled 4,289,931 during 1950, reports American Home Laundry Mfrs. Assn. This is an increase of 41.4 pct over 1949 sales. Sales of dryers during 1950 jumped 201.2 pct over '49 and ironer sales gained 33.1 pct.

Better Inspection Methods Urged by Industry and Military

New York—Less lost time between factory and front line will result if recommendations of industry and the armed services on inspection methods are applied in defense plants, according to the National Industrial Conference Board.

The recommendations, contained in a survey of 300 companies, are based on World War II experience. Industry recommended the military eliminate duplication among the services, give personnel more training, ease impractical or too-rigid specifications.

Military inspection personnel recommended industry study contract specifications more thoroughly, keep better records, and develop better inspection systems, particularly among smaller and medium-sized companies.

Gray Iron Coatings Manual

Cleveland — Product economies and conservation of vital alloys now under rigid government control are described in "Metallic and Non-Metallic Coatings for Gray Iron," a manual released by the Gray Iron Founders' Society.

Scotland Host to 18 New U.S. Industrial Plants Since Last War

Firms find power rates, rentals, and labor supply are favorable.

Glasgow — Eighteen American manufacturers, making products known to almost every home or farm, have set up shop in Scotland since World War II and are employing more than 12,000 men.

Chief of these is International Business Machines.

Low power rates, factory rentals of 12¢ to 17¢ a sq ft per year, and a supply of capable labor have appealed to American industrialists with foreign markets.

Two of the oldest American plants in Scotland are that of the Singer Co., started about the time of the Civil War, and that of Babcock & Wilcox, opened in the 1890's.

Other manufacturers who have opened Scottish plants are: National Cash Register Co., Remington Rand, Burroughs Adding Machine, Honeywell Regulator Co., Rance, Joy Sullivan, Thos. A. Edison, Mine Safety Appliances, Massey Harris, Euclid, UK Time, Westclox, Pal Personna Blades Co., and Northern Beverage Drinking Straws.

Defense Contracts to Metalworking Industry

Selected Contracts, Week of Feb. 5, 1951

Item	Quan.	Value	Company
Buses	1650	$21,450,000	Twin Coach Co., Kent, Ohio
Dishwashing machine	177	288,612	Insinger Machine Co., Philadelphia
Oscilloscope	600	432,523	Waterman Prod.'s Co., Philadelphia
Signal generator	750	412,687	Measurements Corp., Boonton, N. J.
Radar sets	500	129,210	Telephonics Corp., Huntington, N. Y.
Radar beacons	...	493,806	Motorola, Inc., Chicago
Transmissions	269	119,436	American Auto Parts Co., Kansas City, Mo.
Ammeters	30,795	104,130	Neff Equipment Co., Toledo
Track	15,240	748,498	Allis Chalmers, Milwaukee
Tank	1381	25,000,000	Cadillac Mtr. Car Corp., Detroit
Trailer	104	197,091	Miller Trailer, Bradenton, Fla.
Machine tools	...	328,000	Amgears, Inc., Chicago
Truck, set	688	1,076,862	Willys Overland Mtrs., Toledo
Parts	4910	703,566	Willys Overland Mtrs., Toledo
Gearings	372,517	757,881	United Motors Service, Detroit
Shafts	...	280,710	Gear Grinding Machine, Detroit
Truck	181	1,010,710	International Harvester, Detroit
Engines	700	803,669	International Harvester, Detroit
Generator	4070	328,856	United Mtrs. Service, Detroit
Engine	600	914,250	Beiderman Mtrs. Corp., Cincinnati
Truck	1288	1,723,700	Chevrolet Mtr. Div., Detroit
Engine	400	938,236	International Spare Parts, New York
Engine	368	659,025	Ward LaFrance Trk. Corp., Elmira, N.Y.
Aircraft parts	...	6,500,000	Consolidated-Vultee, San Diego
Azel indicator	...	4,259,818	Gilfillan Bros., Inc., Los Angeles
Facilities for manufacture of			
Airplanes		10,000,000	Kaiser-Frazer Corp., Willow Run, Mich.
Engines		14,700,000	Ford Mtr. Co., Detroit
...		30,000,000	Chrysler Corp., Detroit
Tanks		140,000,000	Chrysler Corp., Detroit

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Sees Worldwide Copper Shortage

Riverside, N. J.—An all-time high production rate of copper with no substantial increase in supplies of raw copper ore is breeding a worldwide crisis in copper supply, said James T. Duffy, Jr., Riverside Metal Co. president. He advocated opening up of greater supplies of raw copper from South America by repealing the 2¢ per lb copper tariff and slowing down copper stockpiling.

Launch U.S. Built Cargo Ship

Birmingham—The S. S. Schuyler Otis Bland, first cargo vessel built under the government's new shipbuilding program, was launched at Pascagoula, Miss., last week. The ship, built by Ingalls Shipbuilding Corp., cost about $5 million.

Foresee 40 Million TV Sets

Chicago—A potential television market of 8 million sets a year with a $3 billion volume is forecast by John S. Meck, president of John Meck Industries and Scott Radio Laboratories. Total receiver use will be about 40 million sets, with replacements estimated at once in 5 years. Set production in 1950 was above 7,400,000.

Canadian Plants to Make Jeeps

Ottawa—Orders for production of jeeps and other motor vehicles have been placed by the Department of Defense with Canadian Commercial Corp., a government owned purchasing agency.

Canadian Commercial will negotiate with automotive companies for tooling. The vehicles will probably be made in plants located at Oshawa and Windsor.

December Iron & Steel Production by Districts

As Reported to American Iron & Steel Institute

BLAST FURNACE CAPACITY AND PRODUCTION —NET TONS	Number of Companies	Annual Blast Furnace Capacity July 1, 1950	PRODUCTION							
			PIG IRON		FERRO-MANGANESE AND SPIEGEL		TOTAL			
									Pct of Capacity	
			Dec.	Year to Date	Dec.	Year to Date	Dec.	Year to Date	Dec.	Year to Date
Distribution by Districts										
Eastern	12	13,353,560	1,133,083	12,646,599	23,291	310,314	1,156,374	12,956,913	102.2	97.0
Pitts.-Youngstn.	16	26,735,520	2,094,359	23,990,992	29,516	260,150	2,123,875	24,251,142	93.7	90.7
Cleve.-Detroit	6	7,044,600	560,978	6,781,565			560,978	6,781,565	93.9	96.3
Chicago	7	15,897,190	1,152,086	13,682,338			1,152,086	13,682,338	85.5	86.1
Southern	9	5,215,640	441,898	5,052,437	11,900	103,432	453,498	5,155,869	102.6	99.6
Western	4	3,375,200	246,224	2,656,343			246,224	2,656,343	88.1	79.3
Total	37	71,621,730	5,628,426	64,810,272	64,607	673,896	5,693,033	65,484,168	93.8	91.5

STEEL CAPACITY AND PRODUCTION —NET TONS	Number of Companies	Annual Steel Capacity July 1, 1950	PRODUCTION							
			TOTAL STEEL				Alloy Steel* (Incl. under total steel)		Carbon Ingots-Hot Topped (Incl. under total steel)	
					Pct of Capacity					
			Dec.	Year to Date	Dec.	Year to Date	Dec.	Year to Date	Dec.	Year to Date
Distribution by Districts:										
Eastern	24	20,387,460	1,669,102	16,772,977	96.6	93.2	137,407	1,31..,112	293,720	3,427,382
Pitts.-Youngstn.	33	39,127,940	3,207,119	37,532,013	96.7	95.9	458,015	4,893,210	335,21[illegible]	[illegible],006,001
Cleve.-Detroit	8	9,333,460	786,147	9,244,550	99.4	99.0	48,013	561,427	91,906	1,195,252
Chicago	15	21,351,700	1,755,398	20,921,848	97.0	99.3	150,588	1,613,997	242,570	2,876,250
Southern	8	4,588,320	434,188	4,819,293	111.6	105.3	5,775	54,578	7,926	65,029
Western	11	5,774,620	491,338	5,406,088	100.4	94.2	8,466	103,332	13,119	108,912
Total	78	100,563,500	8,343,290	96,696,769	97.9	96.7	803,264	8,540,656	984,453	11,679,406

* For the purpose of this report, alloy steel includes stainless and any other steel containing one or more of the following elements in the designated amounts: Manganese in excess of 1.65%, and Silicon in excess of 0.60%, and Copper in excess of 0.60%. It also includes steel containing the following elements in any amount specified or known to have been added to obtain a desired alloying effect: Aluminum, Chromium, Cobalt, Columbium, Molybdenum, Nickel, Titanium, Tungsten, Vanadium, Zirconium, and other alloying elements.

Steel Products Committee Recommends Warehouse Changes

Washington — The Steel Products Advisory Committee recommended to the National Production Authority last week the following regulation changes for warehouses: (1.) Amendment of order M-6, change of allotments to provide fixed percentages of average monthly tonnages delivered by producers; (2.) to require warehouses to accept rated orders for sale from inventory on the same basis of producers under M-1, but that there be no extension of such DO orders to producers, and that M-1 be amended to change allotment to further converters to the same formula as for warehouses.

The committee also advised that steel output is adequate to supply both defense and essential civilian needs under present NPA controls without specific cutbacks. It recommended that no end use controls should be imposed without prior consultation with the industry.

Sees Welding Flash on Upswing

New York—More arc welders in more crowded plants as the defense program takes a production upswing will make the incapacitating "welding flash" an increasingly active pest and rob industry of skilled manhours.

Dr. Walter E. Fleischer, medical director of Armco Steel's Rustless Div. and member of the National Society for the Prevention of Blindness, said that the term "welding flash" is a misnomer since the temporary blindness and inability to focus eyes is caused by a more constant exposure to ultra-violet radiations of the welding arc rather than to a sudden flash.

At the onset of shipbuilding increase in 1942 at least 40 pct of all new injuries in shipyards were to the eyes and a large part of these were from "welding flash," said Dr. Fleischer. He estimated that there were over 100,000 eye injuries from flash in U. S. shipyards in 1944.

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Colorado Fuel and Iron To Buy Worth Steel Capital Stock

Pueblo, Colo.—The Worth Steel Co. plant on the Delaware River, at Claymont, will be sold to Colorado Fuel and Iron Corp. in a stock sale transaction scheduled for Mar. 5 completion, reported Charles Allen, Jr., Colorado chairman, and Edward W. Worth, chairman of Worth Steel.

The plant will operate as a subsidiary, Claymont Steel Corp. Colorado Fuel and Iron is studying expansion possibilities to use the eastern plant's tidewater location. Besides extending its product range to the Worth line of steel plate and oil and gas transmission pipe, Colorado will add 468,000 tons to its present capacity of 1,560,000 tons. Its expansion program includes another 350,000 tons.

Involved in the stock transaction are 60,000 shares of capital stock, $100 par value, owned by the Worth family. Principal products of Colorado Fuel's two integrated plants at Buffalo and Pueblo and subsidiaries are wire, rails, and structural steel.

Detroit Steel's $50 Million Expansion Plan to Double Capacity

Detroit—The $50 million expansion program at the Portsmouth, Ohio, works announced last week by Detroit Steel Corp. will double the company's ingot capacity to 1,290,000 tons per year. Detroit Steel Corp. also plans to increase its finishing capacity from 180,000 tons to more than a million tons.

Present plans call for completion of the project by 1952. The new facilities include a second blast furnace rated at 1400 tons, four additional openhearth furnaces of 250 tons each, a new blooming mill, a new 54-in. hot strip mill and a new 54-in. cold-rolled sheet mill.

Detroit Steel Corp. operates cold-rolled strip mills in Detroit and New Haven, Conn. The steel melting capacity is concentrated at Portsmouth.

Ore Consumption Rises

Cleveland—Consumption of Lake Superior district iron ore by U. S. and Canadian blast furnaces rose to 7,289,138 gross tons in December, as compared with 6,860,823 gross tons in November and 6,788,405 gross tons in December, 1949, reported the Lake Superior Iron Ore Assn.

Total 1950 consumption of Lake Superior district iron ore rose to 83,536,678 gross tons, from 70,998,420 gross tons in 1949.

Iron ore stocks on hand at furnaces and Lake Erie docks totaled 37,168,873 gross tons Jan. 1, compared with 41,542,602 gross tons on Dec. 1 and 38,628,510 gross tons on Jan. 1, 1950.

Furnaces depending principally on Lake Superior district iron ore in blast Jan. 1 totaled 175 in the U. S. and nine in Canada.

Steel Nationalization on Feb. 15

London—Unheralded by British steel men, nationalization of the iron and steel industry will be enforced on Feb. 15. Laying the red tape groundwork, the Ministry of Supply announced recently that after May 15 licenses will be needed to produce more than 5000 tons of iron ore per year, 5000 tons of blast furnace pig iron or steel ingots, and 5000 tons of hot-rolled steels.

After that date such output, apart from licensees, will be limited to the Iron and Steel Corp. and nationalized companies.

Centrifugal Pump Line to Grow

Pittsburgh—Wilson-Snyder Manufacturing Div. of Oil Well Supply Co., U. S. Steel subsidiary, will expand its line of centrifugal pumps to include 19 general purpose pumps ranging from 5 to 250 hp of a type formerly made by National Transit Pump and Machine Co., Oil City, Pa.

Wilson-Snyder has acquired the patterns, drawings, tools, testing equipment and inventory for the centrifugal pumps formerly manufactured by National Transit.

No waste in cutting
skid-resistant
U·S·S MULTIGRIP
FLOOR PLATE
● The symmetrical design of U·S·S Multigrip Floor Plate minimizes waste in cutting, making possible neat installations at minimum cost. And regardless of the way the plate is laid or the angle from which it is approached, Multigrip provides positive skid resistance in all directions . . . it's safe, wet or dry! Multigrip is easy to clean, too. There are no pockets to hold dirt, grease, water . . . drainage is complete and immediate.
Whether used on small step-plates of machinery or to cover entire factory floors, Multigrip installations are neat, comfortable underfoot, economical to maintain, permanent . . . and safe. Get further information about Multigrip from your nearest steel warehouse or write to us direct.
Columbia Steel Company, San Francisco
Tennessee Coal, Iron & Railroad Company, Birmingham
United States Steel Company, Pittsburgh
United States Steel Supply Company
Warehouse Distributors, Coast-to-Coast
United States Steel Export Company, New York
USS
MULTIGRIP FLOOR PLATE
UNITED STATES STEEL

JOHNSON BRONZE

Ledaloyl
SELF LUBRICATING
BEARINGS ARE DIFFERENT!

Made from Pre-Alloyed Bearing Bronze Powder

Ledaloyl actually means "lead alloy"... a powder metallurgy product that combines copper, tin and lead in the form of a pre-alloyed bearing bronze.

The introduction of lead as an integral part of the bronze powder provides conformability, aids lubrication, and prevents freezing to the shaft. Myriads of tiny, evenly spaced pores serve as miniature oil wells, metering oil to the shaft when in use, absorbing it when at rest. Therefore, you have adequate lubrication at all times.

Write for FREE Catalog on Stock Sizes of LEDALOYL

Johnson Ledaloyl Bearings are die-molded to size, eliminating costly machining, and consequently, are very low in cost. This is an added cost-saving advantage in odd-shaped, flanged, and self-aligning designs, and in large quantities of a size. Johnson Bronze engineers are glad to assist you in determining whether you can use Ledaloyl Bearings to your advantage. Write today!

Johnson Bronze
SLEEVE BEARING HEADQUARTERS
505 SOUTH MILL STREET • NEW CASTLE, PA.

ECA Finances Metals Exploration

Washington — A new exploration program in French Equatorial Africa to be financed by the Marshall Plan may uncover copper, lead and zinc for United States stockpiles, it is reported by sources here.

ECA has advanced $1,855,000 and the equivalent of $2,385,000 in French counterpart francs to the Mid-African Exploration Co., a subsidiary of Newmont Mining Co., of New York City and to its associated French companies, Explorations Minieres au Congo and Society Miniere du Niari. Repayment of Marshall Plan funds will come in the form of metals to the U. S. stockpile.

GE X-Ray Speeds Increased

Milwaukee — High-speed automatic inspection of thousands of industrial products at low cost will be possible with use of a new crystal detection method, according to General Electric X-Ray Corp.

GE will raise by 100 pct the number of engineers studying X-ray inspection under a special program during 1951. The GE course includes a 3-month period in Milwaukee, plus training in the field.

To Make Tank Transports

Birmingham — The Huntington Processing and Packaging Co. of Huntington, W. Va., has leased Bay No. 2 at the World War II Bechtel-McCone plane modification plant. It will make and assemble Army tank transports weighing 64,000 lb each and replacement parts. The firm, already recipient of a $1 million contract, is negotiating for another $1 million order.

Cleveland Designers Meet Feb. 5

Cleveland—The eighth annual Machine Design Conference, sponsored by the Machine Design Div. of the Cleveland Engineering Society, was to be held Feb. 5 in the society's headquarters.

Canadian Pig Iron Record

Toronto — Canadian pig iron production set a new record for the first 11 months of 1950 with 2,111,563 net tons poured compared with 1,982,350 tons in 1949. November production totaled 208,301 net tons compared with 205,811 tons in October and 157,327 tons for November 1949. Operations were 92.3 pct of capacity.

Production of ferroalloys in November totaled 16,920 net tons compared with 16,959 tons during October and 14,758 tons in November 1949.

Australia Gets Diesel Cars

Philadelphia—The first foreign shipment of the Budd Co.'s self-propelled rail diesel cars left Port Richmond this week destined for Commonwealth Railways of Australia. The shipment consisted of three rail diesel cars and four standard coaches purchased from a United States RR.

Aluminum Output Up 19 Pct

New York—Primary aluminum production during 1950 totaled 1,437,255,518 lbs, an increase of 19 pct over 1949 production, according to the Aluminum Assn. Sheet and plate shipments accounted for 1,155,318,982 lbs. Production will be expanded 20 pct during 1950, it was reported.

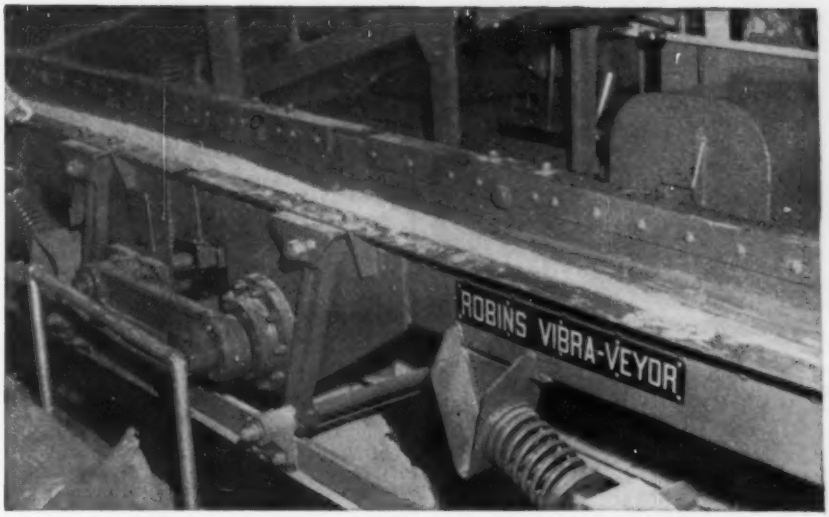
Swedish Steel Shortage Acute

London — The Swedish steel shortage is becoming so acute that some of the smaller industries are faced with suspended production. Appeals have been made to the Board of Trade for equitable distribution.

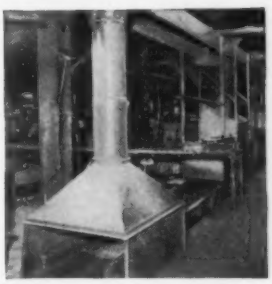
Iron Castings Shipments Off

Washington — November, 1950, shipments of malleable iron castings totaled 85,163 net tons, down slightly from the October figure of 89,968 tons, but 64 pct above the November, 1949, figure of 49,439 tons.

A BETTER, FASTER WAY TO MOVE HARD-TO-HANDLE MATERIALS



THE HEWITT-ROBINS VIBRA-VEYOR® . . .
Up to 200 Feet of Pan Length on One Vibrator!



Moves anything you can't handle with a belt conveyor! Hot or cold, wet or dry, lump or pulverized, packaged or bulk . . . this Hewitt-Robins Vibra-Veyor moves it quickly, quietly, efficiently, at low cost.

Convey material up to 200 feet on one vibrating unit—horizontally . . . down-hill . . . on grades up to 10%. Save on power!

Load it to the hilt at several points along the pan, with any material. It won't bog down. Capacity is limited only by the size of the troughed pan.

Give it rough shock loads! Pan sections are supported by tough malleable iron rockers and soft coil springs—springs that counteract shock loads. The Vibra-Veyor is amazingly quiet—has a full-floating vibrating mechanism.

Install it easily! No special foundation needed, because there's no vibration in the base structure. Your own men can anchor it. Simple to maintain—only 4 points to lubricate.

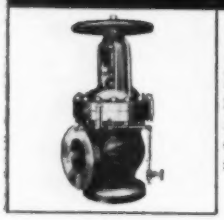
Applications almost limitless! Tell us your hard-to-handle materials handling problem, and we'll build a Vibra-Veyor to solve it. Get the whole story in Bulletin 135. Write to Robins Conveyors Division, Passaic, New Jersey.

HEWITT-ROBINS
VIBRA-VEYOR

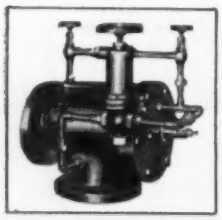
HEWITT-ROBINS INCORPORATED

BELT CONVEYORS (*belting and machinery*) • BELT AND BUCKET ELEVATORS
CAR SHAKEOUTS • DEWATERIZERS • FEEDERS • FOAM RUBBER PRODUCTS
FOUNDRY SHAKEOUTS • INDUSTRIAL HOSE • MINE CONVEYORS • MOLDED RUBBER GOODS
RUBBERLOKT ROTARY WIRE BRUSHES • SCREEN CLOTH • SKIP HOISTS • STACKERS
TRANSMISSION BELTING • VIBRATING CONVEYORS, FEEDERS AND SCREENS

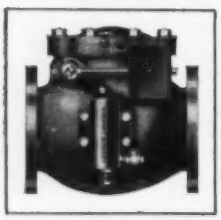
For minimum maintenance and greater all-around dependability USE GOLDEN-ANDERSON *Cushioned* STEAM AND WATER AUTOMATIC VALVES



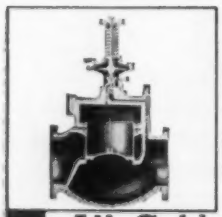
G-A Triple-Acting Non-Return Valve for safety needed on high pressure boilers. Bulletin S-1A sent on request.



G-A Surge Relief Valve protects water lines against excessive pressures caused by surges in the system. Bulletin W-2 describes this valve in detail.



G-A Swing Check Valve for air, water or liquids allows full pipe line flow with minimum pressure drop. Provided with adjustable air cushioning. Bulletin W-1 will interest you.



G-A Altitude Control Valve maintains uniform water level control in tanks, reservoirs, etc. Bulletin W-4 sent on request.

All Golden-Anderson Valves are designed with the patented special double cushioning feature to prevent hammer or shock. *May we cooperate with you on your pressure control problem?*

GOLDEN ANDERSON
Valve Specialty Company
2096 KEENAN BLDG. · PITTSBURGH 22, PA.

STEEL CONSTRUCTION NEWS

Fabricated steel awards this week included the following:

7000 Tons, E. Pikeland Township, Pa., Cromby Station (powerhouse) for Philadelphia Electric Co., to Bethlehem Steel Co., Bethlehem.

5500 Tons, Oak Creek, Wis., Wisconsolidated Electric Power Co. Plant units No. 1 and 2 to Milwaukee Bridge and Iron Co., Worden Allen Co., and Wisconsin Bridge Co.

590 Tons, Redwing County, Minn., bridge 6483 to American Bridge Co.

415 Tons, Redwing County, Minn., bridge 6484 to American Bridge Co.

320 Tons, St. Paul, beam spans for Great Northern RR Co., to American Bridge Co.

211 Tons, Potawattamie County, Iowa, bridge project F-554, to Pittsburgh Des Moines Steel Co.

190 Tons, Cass County, Iowa, bridge project SW-1853, to Pittsburgh Des Moines Steel Co.

Reinforcing bar awards this week included the following:

1200 Tons, Louisville, housing project to Jones and Laughlin Steel Co.

1200 Tons, Cincinnati, U. S. Health Center, to Pollak Steel Co.

1000 Tons, Louisville, housing project, to Laclede Steel Co.

950 Tons, Allegheny County, Pa., LR 765, to U. S. Steel Supply Co.

800 Tons, Minneapolis, warehouse for L. F. Donaldson Co., to U. S. Steel Supply Co.

525 Tons, Montgomery County, Pa., Pennsylvania Dept. of Highways Route 769 Sect. 1D, 2A, F. A. Canuso & Sons, general contractors.

435 Tons, Philadelphia, Southwest Sewage Treatment Plant, Progressive Builders, Pennsauken, N. J., general contractors, to Bethlehem Steel Co., Bethlehem.

375 Tons, Pottstown, Pa., new plant building for Doehler-Jarvis Corp., H. E. Baton Construction Co., Philadelphia, general contractors.

315 Tons, Rock Island, Ill., Central Junior High School, to Laclede Steel Co. through C. H. Langman and Son, Rock Island, Ill.

310 Tons, Philadelphia, elementary school at Longshore and Algon Ave., McCloskey & Co., general contractors, to Bethlehem Steel Co., Bethlehem.

Reinforcing bar inquiries this week included the following:

1000 Tons, Newport, Ind., Wabash ordnance plant.

900 Tons, Chicago, Lake Shore Briar Apts., 329 W. Briar Place, bids taken Feb. 5.

600 Tons, Detroit, caisson job.

355 Tons, Chicago, Congress Street superhighway.

300 Tons, Peoria, Ill., apartment building.

250 Tons, Clearfield, Pa., Harbinson Walker Refractories.

200 Tons, Ankeny, Iowa, Carney School.

180 Tons, Milwaukee, St. Charles Boys Home.

100 Tons, Racine, Massey Harris Mfg. Co.

100 Tons, Chicago, Club Aluminum Co.

100 Tons, Chicago, National Video Corp.

Tool and Die Makers Assn. Asks NPA for Labor Safeguards

New York—Officials of the National Tool and Die Manufacturers' Assn. were to meet this week with NPA officials in Washington to discuss safeguards for their numerically small but valuable work force against draft board depletion.

At a meeting here last week, Herbert F. Jahn, Assn. president, and Centre W. Holmberg, past president, pointed out that the tool and die making industry was unique in importance because it provided the tooling to set off the spark making vast defense output possible.

They said that surplus labor in their field was at best scanty and that loss of even the young experienced workers was a blow. Almost entirely new tooling was needed to push off production in the current crisis because most World War II tooling had been destroyed, it was indicated.

Under Selective Service, a 2A occupational deferment classification is open to industrial workers. Material on importance of industries and critical jobs has been published by the Depts. of Commerce and Labor but the local draft board remains the sole judge.

Copper Use Base Adjustment

Washington — Direction 1 to M-12 was issued last week by National Production Authority permitting a readjustment of the base period use averages for copper and copper base alloys if operations were shut down for 15 days or more during first half of 1950.

It provides that the month or months of the shutdown may be omitted in figuring the monthly average.

Ford Ups Prices in England

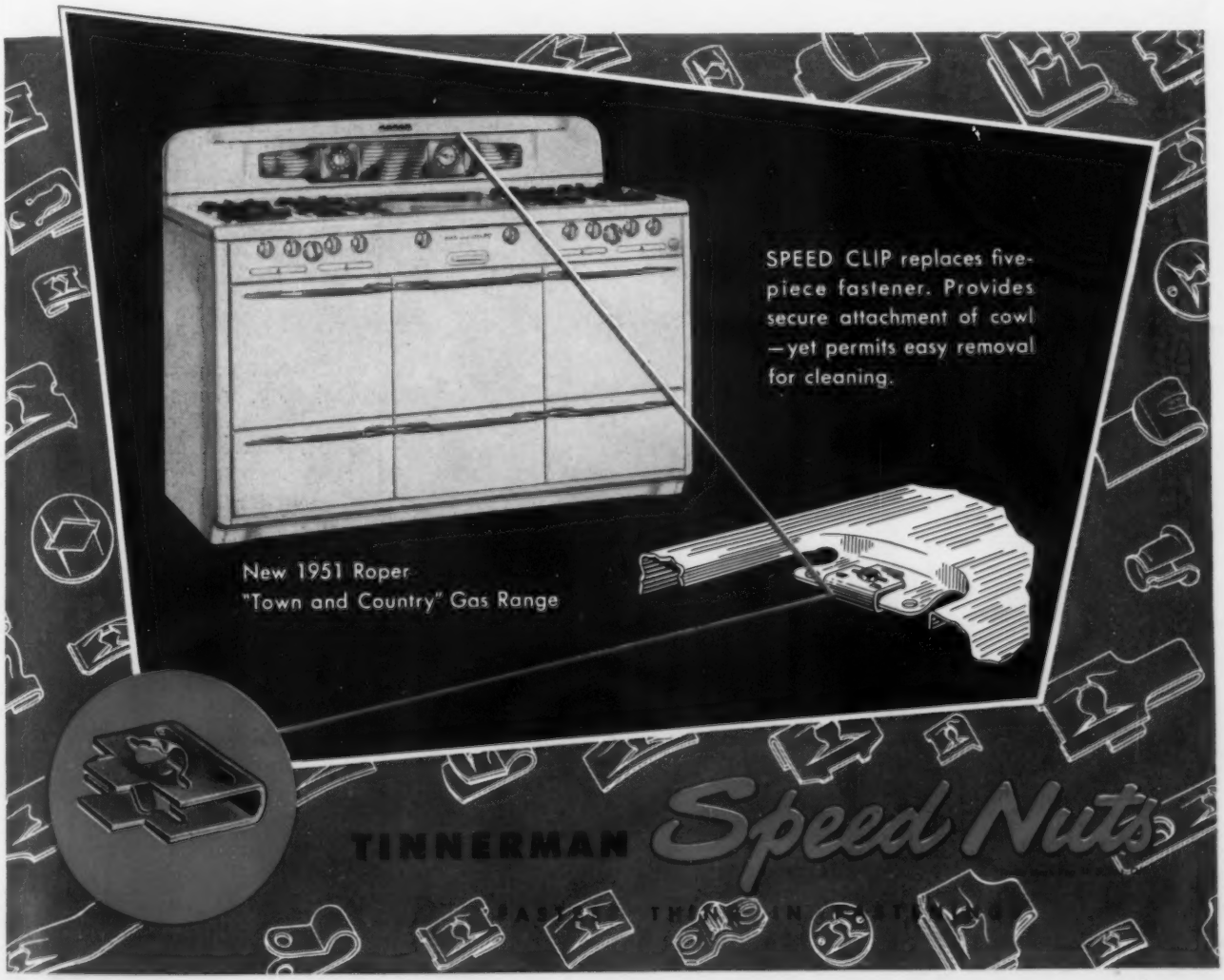
London — Ford Motor Co. in England has increased auto prices from 2½ pct to 10 pct. Still the cheapest British car, the 8 hp Ford Anglia now costs $1005 as compared to $921 previously. Other car makers are expected to follow suit.

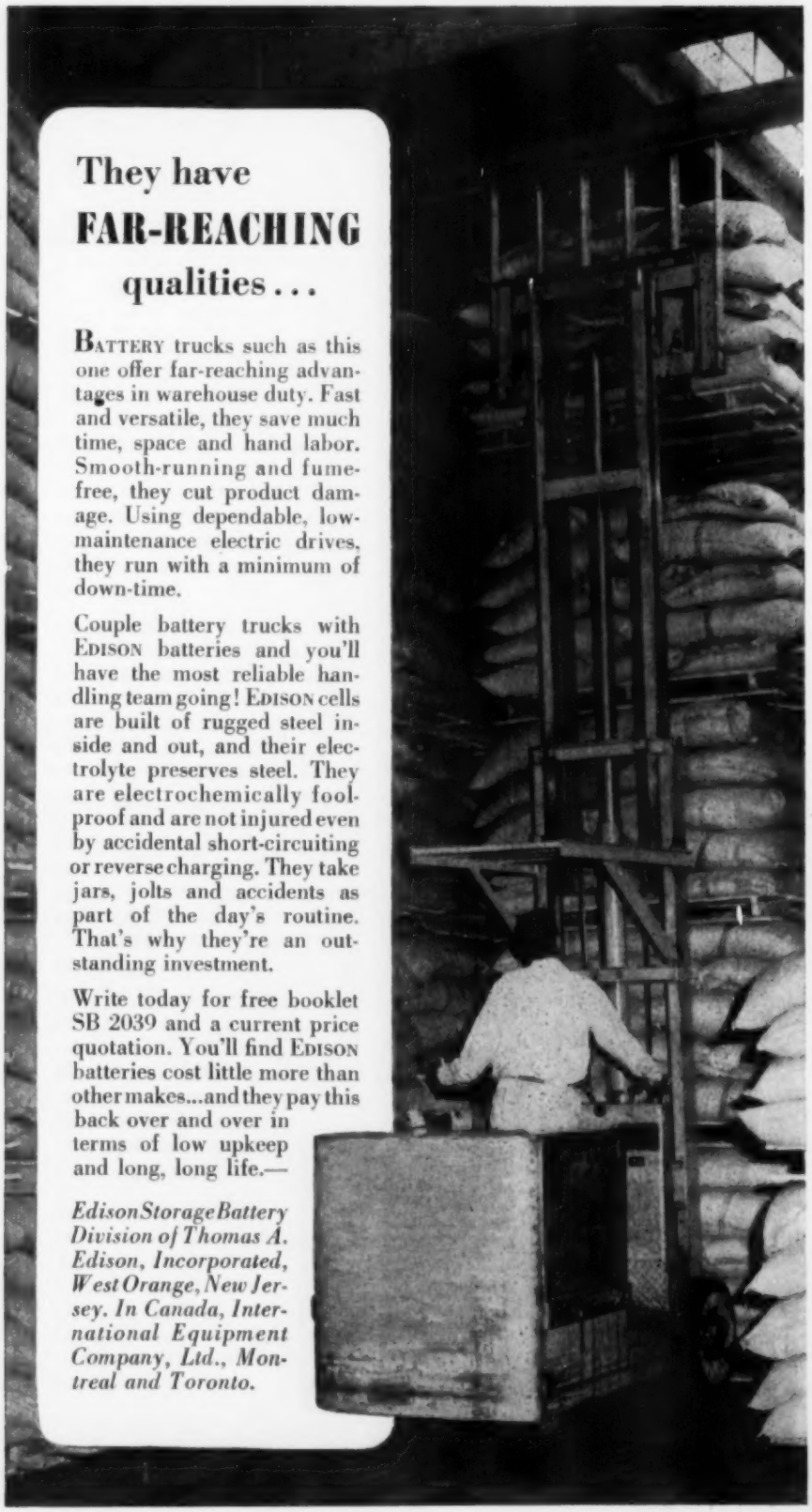
SPEED CLIPS* help ROPER *"boil down"* assembly costs

● "Until recently each vent grill cowl on our ranges was attached with a five-piece fastener," reports the Geo. D. Roper Corporation, Rockford, Illinois.

"Now we are making the same attachment with a *single* SPEED CLIP! As with all 65 of the Tinnerman fasteners used on each of our ranges, the assembly savings on this new application are substantial."

Everywhere you look today you find new proof of SPEED NUT savings power. If you haven't made a recent check of your products, we will be glad to conduct a thorough Fastening Analysis. Ask your Tinnerman representative for details on this service, and write for your copy of SPEED NUT Savings Stories. TINNERMAN PRODUCTS, INC., Box 6688, Department 12, Cleveland 1, Ohio. In Canada: Dominion Fasteners Limited, Hamilton. In Great Britain: Simmonds Aerocessories, Limited, Treforest, Wales.


SPEED CLIP replaces five-piece fastener. Provides secure attachment of cowl —yet permits easy removal for cleaning.
New 1951 Roper
"Town and Country" Gas Range
TINNERMAN Speed Nuts



They have
FAR-REACHING
qualities . . .

BATTERY trucks such as this one offer far-reaching advantages in warehouse duty. Fast and versatile, they save much time, space and hand labor. Smooth-running and fume-free, they cut product damage. Using dependable, low-maintenance electric drives, they run with a minimum of down-time.

Couple battery trucks with EDISON batteries and you'll have the most reliable handling team going! EDISON cells are built of rugged steel inside and out, and their electrolyte preserves steel. They are electrochemically foolproof and are not injured even by accidental short-circuiting or reverse charging. They take jars, jolts and accidents as part of the day's routine. That's why they're an outstanding investment.

Write today for free booklet SB 2039 and a current price quotation. You'll find EDISON batteries cost little more than other makes...and they pay this back over and over in terms of low upkeep and long, long life.—

Edison Storage Battery Division of Thomas A. Edison, Incorporated, West Orange, New Jersey. In Canada, International Equipment Company, Ltd., Montreal and Toronto.

EDISON
Nickel · Iron · Alkaline
STORAGE BATTERIES

Typical Truck Battery

publications

Continued from Page 34

on arch construction and design. "Modern Refractory Practice" is offered without charge to users of refractories, to libraries, and to heads of departments in universities and technical schools. For general distribution or for student use, a charge is made which is much lower than the cost of preparation. *Harbison-Walker Refractories Co. Address requests for the book to this column on company letterhead.*

Lifting Magnets

The line of Rapid heavy-duty lifting magnets, in round, rectangular and bi-polar types, are described in a new 8-p. British bulletin listing complete specifications. Tables showing dimensions, lifting capacities and other technical data are included. *The Rapid Magnetting Machine Co., Ltd.*

For free copy insert No. 4 on postcard, p. 35.

Safety Switch

The Autocon, an auxiliary high-level safety switch designed to operate either audible or visual alarms, is described in a new bulletin showing typical applications in water tanks, rivers and sumps. The unit needs only a ½-in. rise in water level above normal to operate, is not affected by temperature and operates independently of all other controls, as shown on the data sheet. *Automatic Control Co.*

For free copy insert No. 5 on postcard, p. 35.

Dust Collectors

A new 38-p. catalog contains illustrations and specifications of the complete line of Dustkop dust collectors available in standard, pretested units. Illustrations are included of almost every typical dry grinding dust control problem; considerable space is also devoted to buffing and polishing dusts as well as to the control of chips and shavings from both wood and metal-working machines. A cross index permits locating the recommended unit, either by known cfm capacity requirement or by the general classification of the dust involved.

use

Scaife

REVERSE-DRAWN SHAPES

To: SAVE WEIGHT
GAIN STRENGTH
REDUCE COSTS

Made by the revolutionary reverse-draw process, Scaife deep-drawn metal shapes have the improved physical properties, desirable uniformity of wall thickness and other characteristics that are important in reducing weight and increasing strength. The process is ideal for pressure vessels, for other deep-drawn shapes such as rocket and missile bodies and tubes, and for a great variety of containers and enclosures. A brief description of the process is given below. Scaife engineers will be glad to work with manufacturers using or planning to use deep-drawn shapes.

Starting with a circular sheet of steel—

a cup is formed by a conventional drawing operation.

A continuation of this pressing operation turns the cup "inside out" without removing it from the dies—

completing—in a single stroke—a deep-drawn shape having remarkably uniform wall thickness.

The Scaife Reverse-Draw process is suitable for the production of shapes having cross-sections that are circular, oval or rectangular. They can be made with one end completely closed and with the other end flanged or straight. Shapes up to 36 inches maximum diameter can be formed of ferrous and non-ferrous materials, with wall thicknesses up to ¼ inch.

FOUNDED 1802

Scaife Company

Makers of Pressure Vessels for Air, Gases, Liquids

NEW
IRIDITE®
SAVES ZINC
IN BRIGHT FINISHING

This new, chromate, bright-type finish for automatic zinc plating can be applied to zinc plate *of less than .0001" thickness!* It's bluish bright or yellow iridescent in appearance, according to your needs. Resists corrosion, finger marking, staining.

Costs Less To Use— Cost per square foot of treated surface ranges from as low as 3/100c for mill-plated strip to only 1/10c on piece parts. Your present automatic plating cycles present no problem since the solution is completely flexible and can be adapted to any available immersion period, up to more than a full minute. And we've eliminated the need for a bleaching rinse after Iridite. *One dip does it all!* No close controls or special equipment needed.

Costs Less To Ship— The raw materials are a combination of liquid and powder, so you actually *save up to 25%* in shipping costs . . . and you have fewer carboys to handle.

Many manufacturers have already tested and specified this new Iridite finish for all types of zinc-plated products. You will, too, once you've seen and tested it for yourself. *Write today for full information and free samples.* Or, send us a sample of your product for free test processing.

Approved under government specifications.

ALLIED RESEARCH PRODUCTS, INC.
4004 EAST MONUMENT STREET
BALTIMORE 5, MD.

REPRESENTATIVES IN PRINCIPAL INDUSTRIAL CITIES; West Coast: L. H. BUTCHER COMPANY.
Manufacturers of Iridite Finishes
for Corrosion Resistance and Paint Systems for Non-Ferrous Metals; ARP Plating Chemicals.

publications

Continued

Control of vapor and mist from various wet grinding and machining operations is also dealt with. *Aget-Detroit Co.*

For free copy insert No. 6 on postcard, p. 31.

Lift Truck Accessories

A new standard accessories folder pictures the various standard accessories provided for fast, cost-cutting mass handling of unusual materials and special types of loads. As pointed out in the folder, many difficult handling problems can be solved easily by combining a Towmotor lift truck with the correct accessory to pick up, deposit, upend, or revolve the load. The folder shows such accessories as the crane arm, extension back rest, unloader, scoop, side shifter, cotton truck, hydraulic scoop, bale clamp, and many others. It also covers such special attachments as a multiple drum carrier designed to pick up and carry one to four heavy drums at a time. *Towmotor Corp.*

For free copy insert No. 7 on postcard, p. 31.

Crane Scale Brochure

A new 6-p. brochure completely describes the operation and applications of the Hydroscale hydraulic crane scale. Pertinent dimensions of all 34 standard models are tabulated. The new tilt-face-dial model is illustrated and described, as is the Hydro-Stand, a portable frame for supporting the scale when not in use. A partial list of users including the names of 100 nationally known firms is given. *Hydroway Scales, Inc.*

For free copy insert No. 8 on postcard, p. 31.

Weight, Length Calculator

A handy weight and length calculator for all strip metals is designed to compute at a glance the weight and length of strip metals in coils or straight lengths. Although designed so that basic calculations are for cold rolled strip steel, a factor table is included which enables the user to find the answer for aluminum, brass, copper, magnesium, Monel, zinc, and many other metals. It can save time and money by lopping hours

Weirton chose Monel...

Monel scrubber section of new Weirton No. 4 Electrolytic Tin-Plating Line. Monel was chosen because of its high resistance to hot pickling acids. Photos courtesy of the Weirton Steel Co., Weirton, W. Va.

Scrubber tanks of Monel help keep maintenance costs low in Weirton Steel Company's new electrolytic tin-plating line

Capable of a continuous coating speed of 2500 feet per minute, the Weirton Steel Company's new No. 4 Electrolytic Tin-Plating Line is said to be the largest and fastest in industry.

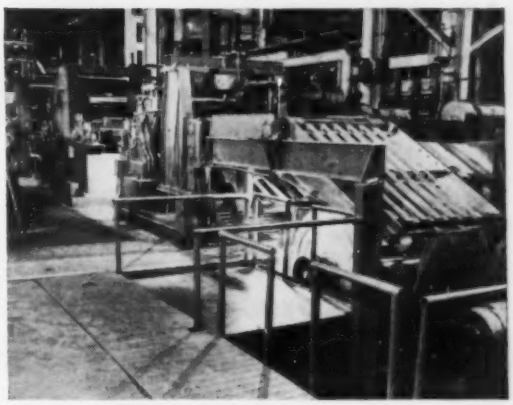
The rated capacity of the new line is 5,000,000 base boxes per year, raising the Weirton Tin Mill production potential to 15,000,000 base boxes annually.

Pickling tanks in the line are 100 feet long... oversize because of the high speed of the strip passing through. The scrubber section, where the steel sheet is washed with hot water to remove carried-over pickling acid, is made of Monel®. Monel was chosen for this application because of its excellent resistance to hot pickling acids... an essential quality for low maintenance costs.

Equipment for the new line was manufactured by the Wean Engineering Company of Warren, Ohio, and the Westinghouse Electric Corporation of Pittsburgh, Pennsylvania. The line was designed by the Weirton Steel Company's own engineering department.

If you – like the Weirton Steel Company – have metal problems involving corrosion or high temperatures, remember that INCO's Technical Service Department is always ready to help you solve them.

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street, New York 5, N. Y.



End of Weirton high-speed electrolytic tin-plating line, showing finished tin plate being coiled. The line is the largest and fastest of its kind, making the Weirton, West Virginia, plant the world's largest tin mill.

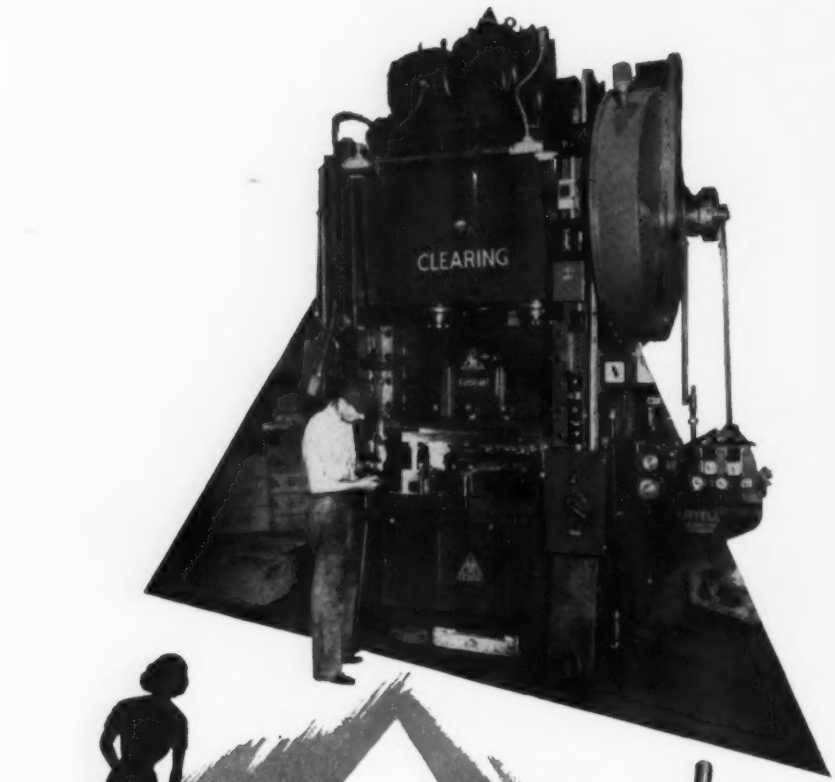
* * *

Although Nickel and Nickel Alloys are currently in short supply, INCO advertisements will continue to bring you news of products, applications, and technical developments.

* * *

MONEL EMBLEM OF SERVICE INCO TRADE MARK

...FOR MINIMUM MAINTENANCE



"Mopping up"

a production problem with CLEARING presses

O-Cedar Corp'n, Chicago, recently introduced a new type of floor mop which has made a big hit with American housewives. A quartet of Clearing presses is turning out the several stamped parts required in an uninterrupted production stream. Two of the presses are fed automatically from coiled strip stock and progressive dies result in a finished stamping at every stroke.

To produce their modern mops, O-Cedar chose modern Clearing presses for their precision and dependability. If you have, or are expecting, a mass production requirement of large or small parts, it will pay you to consult Clearing.

CLEARING MACHINE CORPORATION

6499 WEST 65TH STREET ★ CHICAGO 38, ILLINOIS

CLEARING PRESSES

THE WAY TO EFFICIENT MASS PRODUCTION

CMC CLEARING

publications

Continued

from jobs where conventional computing methods are used. It can be used by engineers, estimators, purchasing agents, press room foremen, and slitter operators. *Precision Steel Warehouse, Inc.*

For free copy insert No. 9 on postcard, p. 35.

Turbine-Generators

Nearly 50 turbine-generator installations, both utility and industrial, are pictured and described in a new 40-p. bulletin covering turbine-generators (500 kw and above). Brief discussions of generator and exciter cooling methods are included. A reference section offers a detailed drawing showing a typical turbine-condenser installation arrangement. Dimensions and weights of standard Elliott units are tabulated for easy reference. *Elliott Co.*

For free copy insert No. 10 on postcard, p. 35.

Squaring Shear Bulletin

The new series Columbia steel squaring shear line, recently improved and enlarged to include models for shearing mild steel plate from 3/16 to 1¼ in. thick, is described in an 8-p. bulletin. The booklet illustrates and details the 3 variations from basic design developed to meet various service requirements, and new features such as the air-operated clutch installed in the flywheel. Other mechanical presses and power press brakes offering efficient, economical operation for metal fabrication are also shown. *Columbia Machinery & Engineering Corp.*

For free copy insert No. 11 on postcard, p. 35.

Air Power Control

The Bellows system of using an opposed hydraulic force to smooth out the natural bounce and springiness of air is described in a new 8-p. bulletin giving details of the Hydro-Check. This unit sets up an opposed, steadying resistance to the thrust of air cylinder pistons, providing a smoother piston rod movement, as shown in the booklet. *Bellows Co.*

For free copy insert No. 12 on postcard, p. 35.

Resume Your Reading on Page 35

production ideas

Continued from Page 38

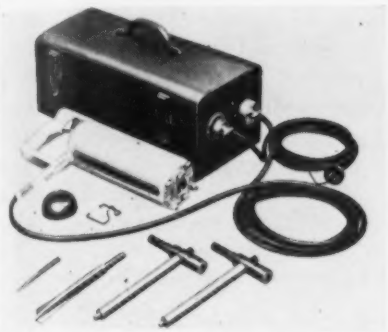
insuring long life and maximum efficiency of lubrication. *Kenco Mfg. Co.*

For more data insert No. 26 on postcard, p. 35.

Electric Hammer

Has one working part; special power unit; 3600 blows per min.

The power unit of the new Model 437 portable electric hammer consists of two alternately energized



magnetic coils, eliminating gears, cranks and connecting rods. A patented contour grip handle makes the tool easy to hold and operate during long use. The 1⅛-in. hammer has an operating range of ¾ to 1⅛-in. diam star drills and extreme operating limits of ⅜ to 1½ in. diam star drills. It is 16¼ in. long and weighs 20 lb. *Skilsaw, Inc.*

For more data insert No. 27 on postcard, p. 35.

Parts Feeder

Multiple discharge tracks increase capacity; handles rivets to blades.

The feeding capacity of Syntron vibratory parts feeders can be

doubled or tripled by equipping them with two or three feeding tracks instead of one as originally furnished. Movement of parts is in the same direction on all tracks,

continuous feeding of automatics

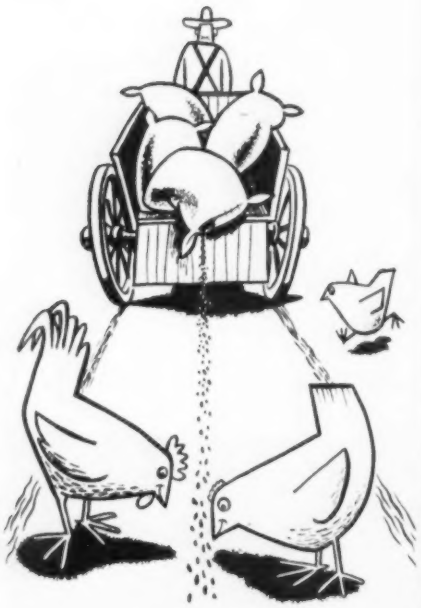
FOLLANSBEE POLISHED BLUE STRIP can be fed directly into automatics—a continuous, time-saving supply system for any kind of metal-forming operation.

from coils of polished blue strip

FOLLANSBEE POLISHED BLUE has a high-gloss, intense blue finish which is the distinguishing characteristic of this superior strip, and a sales feature for any product in which it is used.

sets a fast production pace

FOLLANSBEE POLISHED BLUE STRIP is furnished in continuous coils for productioneering with automatic machines. There's a Follansbee Steel Representative nearby who can tell you more about Follansbee Specialty Steels.



UNBRAKO

has continuous grain flow, too

Unbroken grain flow lines, following the contour or profile of UNBRAKO Screws, *eliminate the straight planes of weakness along which shear can occur.* Heads and threads are stronger and have greater fatigue life. Write for your UNBRAKO Catalog.

Knurling of Socket Screws originated with "Unbrako" in 1934.

-SPS-

STANDARD PRESSED STEEL CO.

JENKINTOWN 17, PENNSYLVANIA

production ideas

Continued

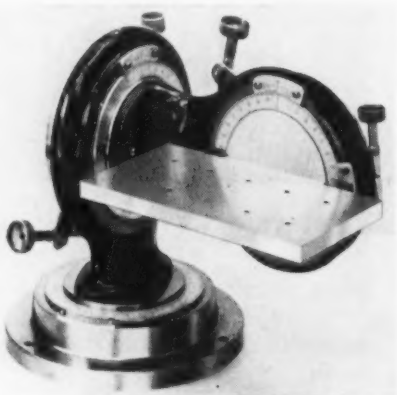
and the discharges may be located all at one point or at various points around the circumference of the bowl, convenient to processing stations. *Syntron Co.*

For more data insert No. 28 on postcard, p. 35.

Angle Computer

Simplifies lay-out of dies, tools; inspects machined parts, castings.

Studler angle computers have three individual directions of rotation assembled into one unit—the radial, vertical and the horizontal.



The 4½ x 9 in. surface plate can be revolved 360° in each plane. It is moved to the approximate required position and then by operating an actuating screw the exact position is found to 0.001 in. or to a minute of a degree. The surface plate is cast iron with eighteen ¼-20 tapped holes for clamping the casting or part to the plate. *Angle Computer Co.*

For more data insert No. 29 on postcard, p. 35.

Micro Circle Cutter

Cuts bolts in metals, plastics, wood.

The micro circle cutter is adjustable in an infinite number of hole diameters within its range, with a micrometer type adjusting screw to assure precise settings. Locking the beam is an easy, quick operation. Two type cutters are available: round shank for drill presses or hand drills; square tapered shank for hand braces. Maximum hole diameters are 4 and 6 in. All are equipped with a ¼ in. high speed steel cutting bit. *Precise Measurements Co.*

For more data insert No. 30 on postcard, p. 35.

Contour Grinder

Improved to increase rigidity and to obtain greater precision.

Improvements in the Visual-Grind contour grinding machine includes a heavy casting of aluminum alloy for the support for the entire optical projection section. Fins in the lamp housing increase radiation and dispersion of heat to prolong lamp life; lamp housing adjustment is by hand wheel, worm gear and screw, rising and falling on dovetail ways; pre-set lens tube insures positive focus. The longitudinal and cross traverse movement of the optical section is on hardened steel ways and rollers for easy adjustment and complete counterbalancing. Bijur one-shot lubrication is standard on all Visual-Grind units. *Cleveland Grinding Machine Co.*

For more data insert No. 31 on postcard, p. 35.

Grease Rig

Two-wheeled service cart dispenses lubricants to industrial bearings.

Compact and highly maneuverable, this grease rig moves rapidly along plant aisles and between closely placed production machines. Since all grease and oil equipment on the rig is removable even re-

motely located machines that are inaccessible to the cart can be greased with the cart's equipment. All equipment is hand-operated. An oil pump dispenses oil either in single shots or in a steady stream. Two models are available: one with bucket-type unit of 30-lb capacity; the other pumps from a 25 to 40 lb refinery filled pail. *Gray Co., Inc.*

For more data insert No. 32 on postcard, p. 35.

Foundry Laboratory Oven

Bakes test cores uniformly; maximum temperature of 550°F.

Of rugged construction, the core-baking oven has a heavily insulated chamber 10 in. wide x 12 in. high x 18 in. deep, designed for maximum temperature of 550°F with sensitive, automatic, thermostatic control. A special double type air-diffusing system insures a large volume of air entering the oven with an equal amount of air intake

at both the front and back of the chamber. In this way with a minimum of three to four air changes per min, convected heat is used to best advantage for drying and baking, rapidly eliminating the gases and moisture. *Claud S. Gordon Co.*

For more data insert No. 33 on postcard, p. 35.

Weight Indicator

16-in. diam dial for closer readings; and compensation for tare loads.

The new Dillon weight indicator will weigh such materials as steel, wire, aluminum foil, scrap, etc., and is especially advantageous where long or bulky objects cannot be easily moved to a central weighing point. Pivots and bearings of the industrial scale are highly polished, hardened tool steel and a 360° swivel hook is standard. Accuracy is to within one division of the indicated reading at any point on the dial. *W. C. Dillon & Co., Inc.*

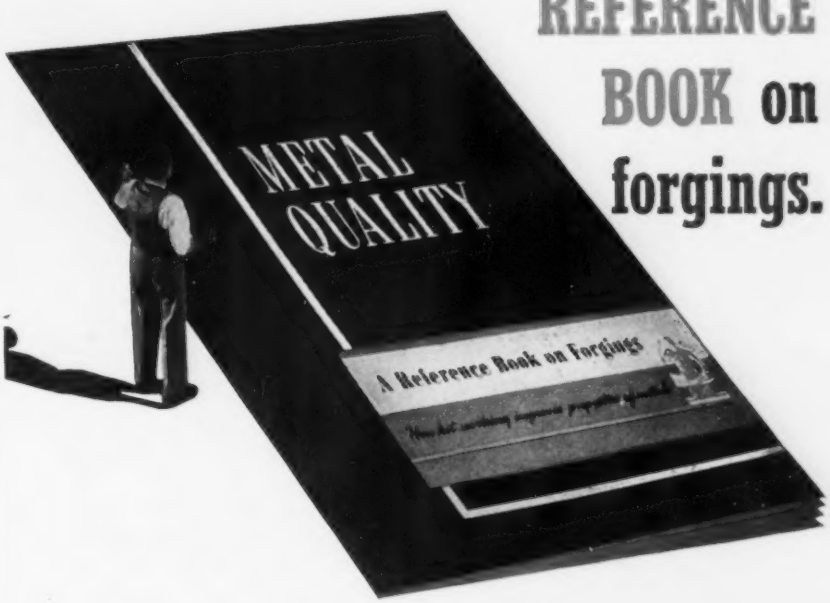
For more data insert No. 34 on postcard, p. 35.

Drum Clamp

Handles cylindrical objects either individually or as pallet loads.

The device picks up individual drums or barrels, and loads a pallet which is then handled after two

What *Forgings* have that offer so many more economic, engineering and production advantages than can be obtained with any other material, is illustrated and described in this REFERENCE BOOK on forgings.

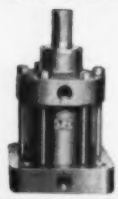


Write for a copy. Then consult a forging engineer about how you can obtain the correct combination of mechanical qualities in forgings for your particular type of equipment.

DROP FORGING ASSOCIATION
605 HANNA BUILDING
CLEVELAND 15, OHIO

Please send 60-page booklet entitled "Metal Quality—How Hot Working Improves Properties of Metal", 1949 Edition.

Name.....
Position.....
Company.....
Address.....



HYDRAULIC CYLINDERS

AIR CYLINDERS

A tip for you on trimming costs—put T-J products to work in your plant! Engineered to *save labor* and give you *plus performance* in a wide range of applications.

For those "muscle jobs" of pushing, pulling or lifting—100 lb. or 50,000 lb.—save money by mechanizing with T-J Air and Hydraulic Cylinders! For high production in rivet-setting, specify T-J Rivitors with automatic feeding and setting . . . air or electric power. For setting clinch nuts in automotive body panels, door locks and other products . . . set 'em 3 to 5 times faster with T-J Clinchors! For more work between grinds in tough die steels . . . T-J Cutters! For accurate, automatic control of presses, brakes, other machines and equipment . . . T-J Air Controls.

That's it—get T-J *all the way* for tough jobs! Send for latest catalogs. The Tomkins-Johnson Co., Jackson, Mich.

RIVITORS

CLINCHORS

CUTTERS

AIR CONTROLS

T-J 34 YEARS EXPERIENCE

TOMKINS-JOHNSON

RIVITORS AIR AND HYDRAULIC CYLINDERS CUTTERS CLINCHORS

production ideas

Continued

curved rubber-faced grab plates are removed from the forks. Adjustable from 32 in. inside spacing to 19 in., the two forks move simultaneously in or out by separate hydraulic cylinders. A pressure reducer valve controls gripping pressure and an accumulator keeps the pressure constant for safety in moving drums. *Baker Raulang Co.*

For more data insert No. 35 on postcard, p. 35.

Dimensional Air Gage

Measures the dimension variation directly on its graduated scale.

Called the Dimensionair, this gage is reported to have exceptional measuring range and clearance combined with almost absolute stability. The 0.003 in. range of the

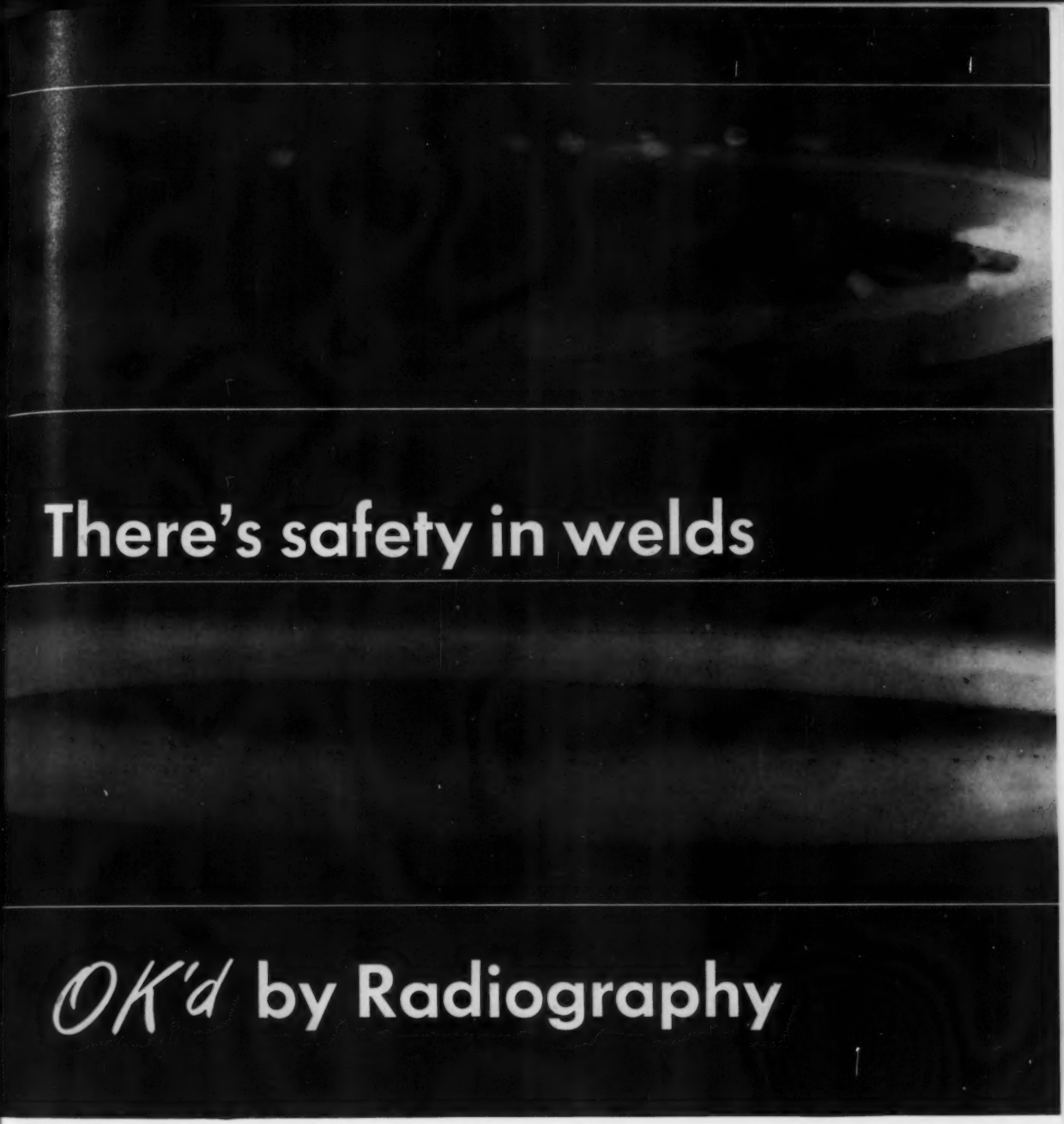
gage enables the user to determine the size of a hole before he reaches the ultimate size required. Irregular and tapered holes are easily gaged. Setting the gage is simple, quick and positive. The master jet is fixed; no complicated adjustments are required. The instrument operates on air pressure between 40 and 100 lb. Tolerances are read directly on the scale just as on a dial indicator. Variations in millionths are easily determined. *Federal Products Corp.*

For more data insert No. 36 on postcard, p. 35.

Bench Blast Cabinet

Uses soft abrasives, sand or metal, for cleaning small metal parts.

Two light fixtures for illuminating the interior, an exhaust fan and a dust bag for making the operation dustless are equipment on a new handy sandblast cabinet for clean-



There's safety in welds

OK'd by Radiography

Radiographs showing welds in gas tanks. Lower radiograph shows acceptable tank weld.

These radiographs show the welds in propane gas tanks. The upper discloses a lack of fusion and heavy gas porosities. Out of a lot of several hundred tanks, Radiography showed a dozen to be hazardous—twelve potential accidents that were prevented.

Because Radiography can prove the soundness of welds it is opening new fields to welders in manufacturing pressure vessels and in other applications where welding was once barred, it is now an accepted procedure.

This is why Radiography can help you build your business as well as earn a reputation for highly satisfactory work.

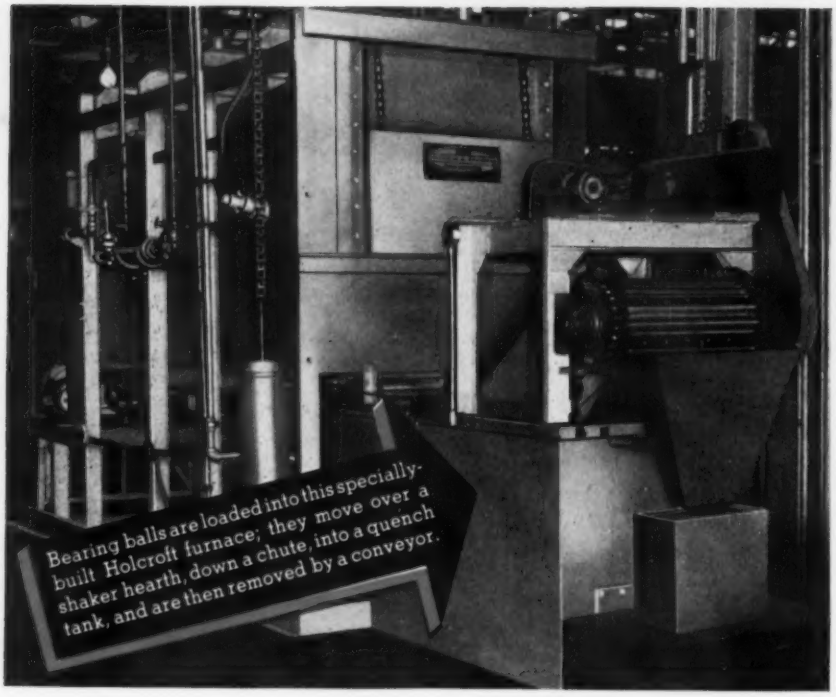
If you would like to know more about what it can do for you in your own work, discuss it fully with your x-ray dealer.

EASTMAN KODAK COMPANY
X-ray Division
Rochester 4, New York

Radiography...

another important function of photography

Kodak
TRADE-MARK


Bearing balls are loaded into this specially-built Holcroft furnace; they move over a shaker hearth, down a chute, into a quench tank, and are then removed by a conveyor.

this custom-built Holcroft furnace

HARDENS BEARING BALLS TO EXACT SPECIFICATIONS

This continuous shaker-hearth furnace is typical of the many kinds of heat-treat furnaces built by Holcroft.

Designed to meet exact hardness specifications, this furnace heat treats 150 pounds of bearing balls per hour. The operating cycle totals less than 30 minutes.

The adjustable shaker hearth maintains even heating of the work and uniform load distribution. Low-cost heat is provided by Holcroft removable electric heating elements with three-zone automatic control. If desired, Holcroft gas-fired radiant tube burners can be used. Because the furnace is above floor level and has no permanent connections, it can be moved quickly and easily to any part of the production line.

No matter what your heat treat problem may be, Holcroft can provide a furnace that will do the job quickly, efficiently and at a low unit cost. Write today for further information.

BLAZING THE HEAT-TREAT TRAIL

SINCE 1916 **Holcroft AND COMPANY**

BUILT BY HOLCROFT & COMPANY DETROIT, MICH.

PRODUCTION HEAT TREAT FURNACES FOR EVERY PURPOSE

6545 EPWORTH BLVD. DETROIT 10, MICHIGAN

CHICAGO 9 — C. H. Martin, A. A. Engelhardt, 4209 South Western Blvd.
CLEVELAND 15 — Wallace F. Schott, 1900 Euclid Avenue
HOUSTON 1 — R. E. McArdle, 5724 Navigation Blvd.
CANADA — Walker Metal Products, Ltd., Windsor, Ontario
EUROPE — S. O. F. I. M., Paris 8, France

production ideas

Continued

ing dies, tools, pistons, piston rings, valves and other small parts. It uses ground corn cobs or ground nut shells to remove surface impurities without scoring the metal.

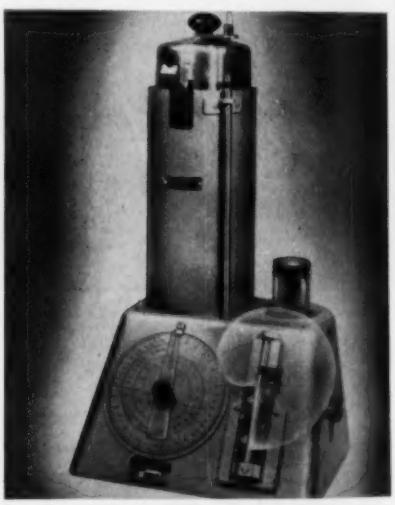
Two rubber sleeves for both arms of the operator have rubber gloves attached. *W. W. Sly Mfg. Co.*

For more data insert No. 37 on postcard, p. 35.

Permeability Meter

Familiar orifice method has been added for rapid control testing.

The latest developments in permeability testing are embodied in the new Dietert No. 335 Perm-



meter. The construction complies with the requirements for standard A.F.S. stopwatch permeabilities, independent of operator attention. A clear plastic permeability scale marks an improvement in accuracy for this method. *Harry W. Dietert Co.*

For more data insert No. 38 on postcard, p. 35.

Resume Your Reading on Page 39

IRON AGE *markets and prices*

market briefs and bulletins

coke prices—While increases in coke prices had not been announced at press time, price of coke is expected to go up. Ceiling Price Regulation 3 passed last week permitted increases in coal prices to accommodate increases to miners allowed under CPR 2. Ceilings for mines west of the Mississippi would be the highest prices charged between Mar. 1, 1950 and Jan. 15, 1951. Average increase in coal would be about 25¢ per ton. A special anthracite regulation gives a 90¢ a ton increase over the Jan. 2 level.

product mix—Plates are being shipped to defense and essential civilian consumers in ever increasing quantities. One large producer is currently scheduling more than 60 pct of its plate output for these programs. Another is turning out plate on its strip facilities. Still another producer who doesn't normally sell plate is now turning it out for the freight car program. Plate requirements are expected to continue growing.

faster procurement—The Secretary of Defense and the Munitions Board have issued directives to military departments emphasizing the need for speed in placing contracts for major military items. They also urge development of adequate production bases for later increases. It will probably take 60 days to translate major defense programs into numbers of items.

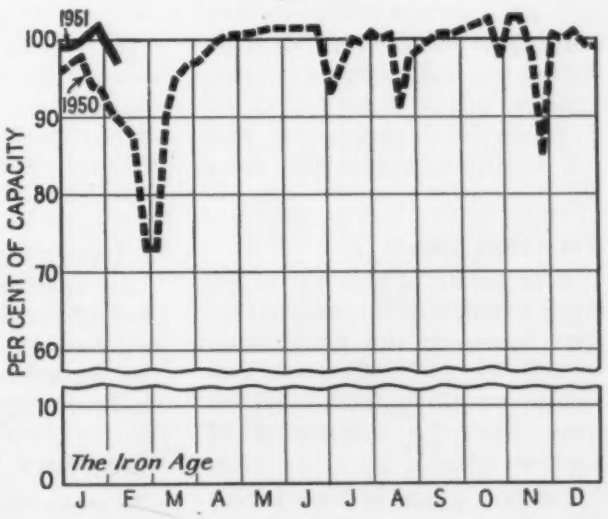
stainless—You might get some stainless steel without a DO order, but it won't be easy, and it's getting harder. One stainless producer is virtually booking nothing but DO's. If a customer tries to place an order without a DO they check to see if he can get one. If not, the order goes in the hold file to be filled whenever possible.

army construction—The Philadelphia District of the Army Corps of Engineers plans $100 million worth of building in Pennsylvania, New Jersey and Delaware. Design is in progress in some cases. Architects and design engineers are being approached in others. Total value of the steel for these jobs is not yet known.

foreign pig—Increased steelmaking at home may give added importance to foreign pig iron. The demand for pig to feed expanding steel furnaces is growing steadily. Some producers whose product went to foundries are finding more profit in making pig for steelmaking operations. This leaves foundries high and dry. With large export of finished military goods ahead, and a tighter scrap market at home, foreign pig for foundries could become increasingly important during the next 2 years.

revolution—Weirton Steel Co. has developed a revolutionary electro-tinplating process that will mean savings of 25 to 50 pct in consumption of strategic tin and at the same time increase production of tinplate. With the new process the electrolytic tinplate is coated on one side with sufficient tin to protect contents of the can and on the other side with just enough tin to prevent corrosion. The usual practice is to apply the same weight coating on both sides. This new tinplate is now being marketed by Weirton.

Steel Operations**



District Operating Rates—Per Cent of Capacity**

Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	West	Buffalo	Cleveland	Detroit	Wheeling	South	Ohio River	St. Louis	East	Aggregate
Jan. 28	97.0	100.0*	94.0*	99.0	103.8	104.0	97.0	108.0	100.0	106.0	90.5	95.1	98.0	101.0*
Feb. 4	96.0	99.5	91.0	96.0	105.8	104.0	51.5	109.0	100.0	106.0	88.2	95.1	105.0	96.5†

* Revised.
** Beginning Jan. 1, 1951, operations are based on an annual capacity of 104,229,650 net tons.
† Tentative.

nonferrous metals

outlook and market activities

NONFERROUS METALS PRICES

	Jan. 31	Feb. 1	Feb. 2	Feb. 3	Feb. 5	Feb. 6
Copper, electro, Conn.	24.50	24.50	24.50	24.50	24.50	24.50
Copper, Lake delivered	24.625	24.625	24.625	24.625	24.625	24.625
Tin, Straits, New York	$1.825	$1.825	$1.825	....	$1.825	$1.825*
Zinc, East St. Louis	17.50	17.50	17.50	17.50	17.50	17.50
Lead, St. Louis	16.80	16.80	16.80	16.80	16.80	16.80

Note: Quotations are going prices.

*Tentative.

by R.Hatschek

New York — The nonferrous scrap trade is in a state of loaded quiet. The quiet was brought about by the iron and steel scrap price rollback order of the Economic Stabilization Agency which finally went into effect on Wednesday.

Nobody has much material on hand, and whatever is around is being moved fast so the rollback will not cost too much. Dealers here expect rollbacks in this trade "soon" but just how fast the government will do something is not to be predicted, particularly with the enforcement squabble going on.

Tin Prices Unfair

It is predicted that the order, when it comes, will establish ceilings based on the price levels quoted by the refineries. This would be realistic and provide for more equitable distribution of scrap metals.

Tin prices seem to have settled down to a fairly steady figure. This, however, is only outward, as many of the sellers have been frozen out of the high prices quoted. Each company has its own ceiling at present; that is, the highest it was able to sell at before the price fix. A standard must be established for this commodity soon in the interest of eliminating these inequities.

National Production Authority, because of numerous requests for adjustment under order M-12, have added Direction 1 to the copper order. The new addition permits the user to make his own adjustment without specific appeal to NPA if his business was shut down for a 15-day period during the base period.

If such is the case, the consumer is to calculate his base production after eliminating the down time from his base period. Detailed, written records of all facts pertaining to the recalculation must be made out and kept on file for at least 2 years.

An additional 70,000 tons per year of Special High Grade zinc will become available when the new Peruvian plant of the Cerro de Pasco Copper Corp. gets into production. An Export-Import Bank loan, up to a maximum of $20,800,000, will finance the construction of these facilities. When operations are scheduled to proceed is not known.

Aluminum Output Up

The Aluminum Association reports fourth quarter 1950 production of 382,176,940 lb of aluminum, bringing the total for the year up to 1,437,255,518 lb. This exceeds 1949 production by 19 pct, and the outlook for 1951 is an increase to about 1.7 billion lb or more, with further increases in 1952.

Aluminum sheet and plate shipments totaled 1,155,318,982 lb in 1950, an increase of 48 pct above the previous year. Shipments of permanent-mold rough castings (not including pistons) totaled 34,336,366 lb and foil shipments added up to 90,679,719 lb.

It is reported that a representative of Chilean industry and the Chilean government will soon come to this country in order to appeal for an increase in the price of copper. The higher price, it is claimed, would not be artificial and would lead to higher production of the metal.

At press time, unauthorized strike of rail switchmen was still tying up shipments of badly needed copper and other supplies.

MONTHLY AVERAGE PRICES

The average prices of the major non-ferrous metals in January based on quotations appearing in THE IRON AGE, were as follows:

	Cents Per Pound
Electrolytic copper, Conn. Valley	24.50
Lake copper, delivered	24.625
Straits tin, New York	$1.7172
Zinc, East St. Louis	17.50
Zinc, New York	18.22
Lead, St. Louis	16.80
Lead, New York	17.00

MILL PRODUCTS

(Cents per lb, unless otherwise noted)

Aluminum

(Base 30,000 lb, f.o.b. ship. pt. frt. allowed)

Flat Sheet: 0.188 in., 2S, 3S, 30.1¢; 4S, 61S-O, 32¢; 52S, 34.1¢; 24S-O, 24S-OAL, 32.9¢; 75S-O, 75S-OAL, 39.9¢; 0.081 in., 2S, 3S, 31.2¢; 4S, 61S-O, 33.5¢; 52S, 35.6¢; 24S-O, 24S-OAL, 34.1¢; 75S-O, 75S-OAL, 41.8¢; 0.032 in., 2S, 3S, 32.9¢; 4S, 61S-O, 37.1¢; 52S, 39.8¢; 24S-O, 24S-OAL, 41.7¢; 75S-O, 75S-OAL, 52.2¢.

Plate: ¼ in. and heavier: 2S, 3S-F, 28.3¢ 4S-F, 30.2¢; 52S-F, 31.8¢; 61S-O, 30.8¢; 24S-O, 24S-OAL, 32.4¢; 75S-O, 75S-OAL, 38.8¢.

Extruded Solid Shapes: Shape factors 1 to 5, 36.2¢ to 74.5¢; 12 to 14, 36.9¢ to 89¢; 24 to 26, 39.6¢ to $1.16; 36 to 38, 47.2¢ to $1.70.

Rod, Rolled: 1.5 to 4.5 in., 2S-F, 3S-F, 37.5¢ to 33.5¢; cold-finished, 0.375 to 3 in., 2S-F, 3S-F, 40.5¢ to 35¢.

Screw Machine Stock: Rounds, 11S-T3, ⅛ to 11/32 in., 53.5¢ to 42¢; ⅜ to 1½ in., 41.5¢ to 39¢; 1 9/16 to 3 in., 38.5¢ to 36¢; 17S-T4 lower by 1.5¢ per lb. Base 5000 lb.

Drawn Wire: Coiled, 0.051 to 0.374 in., 2S, 39.5¢ to 29¢; 52S, 48¢ to 35¢; 56S, 51¢ to 42¢; 17S-T4, 54¢ to 37.5¢; 61S-T4, 48.5¢ to 37¢; 75S-T6, 84¢ to 67.5¢.

Extruded Tubing, Rounds: 63S-T5, OD in in.: 1¼ to 2, 37¢ to 54¢; 2 to 4, 33.5¢ to 45.5¢; 4 to 6, 34¢ to 41.5¢; 6 to 9, 34.5¢ to 43.5¢.

Roofing Sheet, Flat: 0.019 in. x 28 in. per sheet, 72 in., $1.142; 96 in., $1.522; 120 in., $1.902; 144 in., $2.284. Gage 0.024 in. x 28 in., 72 in., $1.379; 96 in., $1.839; 120 in., $2.299; 144 in., $2.759. Coiled Sheet: 0.019 in. x 28 in., 28.2¢ per lb.; 0.024 in. x 28 in., 26.9¢ per lb.

Magnesium

(F.o.b. mill, freight allowed)

Sheet and Plate: FS1-O, ¼ in. 63¢; 3/16 in. 65¢; ⅛ in. 67¢; B & S Gage 10, 68¢; 12, 72¢; 14, 78¢; 16, 85¢; 18, 93¢; 20, $1.05; 22, $1.27; 24, $1.67. Specification grade higher. Base: 30,000 lb.

Extruded Round Rod: M, diam in., ¼ to 0.311 in., 74¢; ½ to ¾ in., 57.5¢; 1¼ to 1.749 in., 53¢; 2½ to 5 in., 48.5¢. Other alloys higher. Base: Up to ¾ in. diam, 10,000 lb; ¾ to 2 in., 20,000 lb; 2 in. and larger, 30,000 lb.

Extruded Solid Shapes, Rectangles: M. In weight per ft, for perimeters less than size indicated, 0.10 to 0.11 lb, 3.5 in., 62.3¢; 0.22 to 0.25 lb, 5.9 in., 59.3¢; 0.50 to 0.59 lb, 8.6 in., 56.7¢; 1.8 to 2.59 lb, 19.5 in., 53.8¢; 4 to 6 lb, 28 in., 49¢. Other alloys higher. Base, in weight per ft of shape: Up to ½ lb, 10,000 lb; ½ to 1.80 lb, 20,000 lb; 1.80 lb and heavier, 30,000 lb.

Extruded Round Tubing: M, wall thickness, outside diam, in., 0.049 to 0.057, ¼ in. to 5/16, $1.40; 5/16 to ⅜, $1.26; ½ to ⅝, 93¢; 1 to 2 in., 76¢; 0.165 to 0.219, ⅝ to ¾, 61¢; 1 to 2 in., 57¢; 3 to 4 in., 56¢. Other alloys higher. Base, OD in in.; Up to 1½ in., 10,000 lb; 1½ in. to 3 in., 20,000 lb; 3 in. and larger, 30,000 lb.

Titanium

(10,000 lb base, f.o.b. mill)

Commercially pure and alloy grades: Sheet and strip, HR or CR, $15; Plate, HR, $12; Wire, rolled and/or drawn, $10; Bar, HR or forged, $6; Forgings, $6.

Nickel and Monel

(Base prices, f.o.b. mill)

	"A" Nickel	Monel
Sheets, cold-rolled	71½	57
Strip, cold-rolled	77½	60
Rods and bars	67½	55
Angles, hot-rolled	67½	55
Plates	69½	56
Seamless tubes	100½	90
Shot and blocks	....	50

Copper, Brass, Bronze

(Freight prepaid on 200 lb includes duty)

	Sheets	Rods	Extruded Shapes
Copper	41.03	....	40.63
Copper, h-r	....	36.88	....
Copper, drawn	....	38.18	....
Low brass	39.15	38.84	....
Yellow brass	38.28	37.97	....
Red brass	40.14	39.83	....
Naval brass	43.08	38.61	38.07
Leaded brass	....	32.63	36.70
Com'l bronze	41.13	40.82	....
Mang. bronze	45.96	40.65	41.41
Phos. bronze	60.20	60.45	....
Muntz metal	40.43	36.74	37.99
Ni silver, 10 pct	49.27	51.49	....
Arch. bronze	....	....	35.11

PRIMARY METALS

(Cents per lb, unless otherwise noted)

Aluminum ingot, 99+%, 10,000 lb, freight allowed	19.00
Aluminum pig	18.00
Antimony, American, Laredo, Tex.	42.00
Beryllium copper, 3.75-4.25% Be	$1.56
Beryllium aluminum 5% Be, Dollars per lb contained Be	$69.00
Bismuth, ton lots	$2.25
Cadmium, del'd	$2.55
Cobalt, 97-99% (per lb)	$2.10 to $2.17
Copper, electro, Conn. Valley	24.50
Copper, Lake, delivered	24.625
Gold, U. S. Treas., dollars per oz.	$35.00
Indium, 99.8%, dollars per troy oz.	$2.25
Iridium, dollars per troy oz.	$200
Lead, St. Louis	16.80
Lead, New York	17.00
Magnesium, 99.8+%, f.o.b. Freeport, Tex., 10,000 lb	24.50
Magnesium, sticks, 100 to 500 lb	42.00 to 44.00
Mercury, dollars per 76-lb flask, f.o.b. New York	$225.00
Nickel, electro, f.o.b. New York	53.55
Nickel oxide sinter, f.o.b. Copper Cliff, Ont., contained nickel	46.75
Palladium, dollars per troy oz.	$24.00
Platinum, dollars per troy oz.	$90 to $93
Silver, New York, cents per oz.	90.16
Tin, New York	$1.825
Titanium, sponge	$5.00
Zinc, East St. Louis	17.50
Zinc, New York	18.22
Zirconium copper, 50 pct	$6.20

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5-5 ingot	
No. 115	29.00
No. 120	28.50
No. 123	28.00
80-10-10 ingot	
No. 305	35.00
No. 315	32.00
88-10-2 ingot	
No. 210	46.25
No. 215	43.25
No. 245	36.00
Yellow ingot	
No. 405	25.00
Manganese bronze	
No. 421	29.75

Aluminum Ingot

(Cents per lb, 30,000 lb lots)

95-5 aluminum-silicon alloys	
0.30 copper, max.	33.25-34.25
0.60 copper, max.	33.00-34.00
Piston alloys (No. 122 type)	30.50-31.00
No. 12 alum. (No. 2 grade)	30.00-30.50
108 alloy	30.25-30.75
195 alloy	31.25-31.75
13 alloy	33.50-34.00
ASX-679	30.50-31.00

Steel deoxidizing aluminum, notch-bar granulated or shot

Grade 1—95-97½%	32.00-32.50
Grade 2—92-95%	30.25-30.75
Grade 3—90-92%	29.25-29.75
Grade 4—85-90%	28.75-29.25

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, freight allowed, 500 lb lots)

Copper	
Cast, oval, 15 in. or longer	39⅛
Electrodeposited	33⅜
Rolled, oval, straight, delivered	38⅞
Forged ball anodes	43
Brass, 80-20	
Cast, oval, 15 in. or longer	34¾
Zinc, oval	26½
Ball anodes	25½
Nickel 99 pct plus	
Cast	70.50
Rolled, depolarized	71.50
Cadmium	$2.80
Silver 999 fine, rolled, 100 oz lots, per troy oz, f.o.b. Bridgeport, Conn.	79½

Chemicals

(Cents per lb, f.o.b. shipping points)

Copper cyanide, 100 lb drum	52.15
Copper sulfate, 99.5 crystals, bbl.	12.85
Nickel salts, single or double, 4-100 lb bags, frt. allowed	20½
Nickel chloride, 375 lb drum	27½
Silver syanide, 100 oz lots, per oz.	67¼
Sodium cyanide, 96 pct domestic 200 lb drums	19.25
Zinc cyanide, 100 lb drums	45.85

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add ½¢ per lb for shipments of 20,000 to 40,000 lb; add 1¢ for more than 40,000 lb)

	Heavy	Turnings
Copper	23	22¼
Yellow Brass	20½	18¾
Red brass	21½	20¾
Comm. bronze	21¾	21
Mang. bronze	19½	18⅝
Brass rod ends	19⅞	....

Custom Smelters' Scrap

(Cents per pound, carload lots, delivered to refinery)

No. 1 copper wire	21.50
No. 2 copper wire	20.00
Light copper	19.00
Refinery brass	19.50*
Radiators	15.00

*Dry copper content.

Ingot Makers' Scrap

(Cents per pound, carload lots, delivered to producer)

No. 1 copper wire	23.00
No. 2 copper wire	22.00
Light copper	21.00
No. 1 composition	22.00
No. 1 comp. turnings	21.50
Rolled brass	18.50
Brass pipe	20.50
Radiators	17.50
Heavy yellow brass	17.00

Aluminum

Mixed old cast	18½—19
Mixed new clips	20½
Mixed turnings, dry	18½
Pots and pans	18½—19
Low copper	21½—22

Dealers' Scrap

(Dealers' buying prices, f.o.b. New York in cents per pound)

Copper and Brass

No. 1 heavy copper and wire	19½—20
No. 2 heavy copper and wire	18 —18½
Light copper	17 —17¼
New type shell cuttings	17 —17¼
Auto radiators (unsweated)	14½—15
No. 1 composition	17 —17½
No. 1 compositon turnings	16½—17
Clean red car boxes	15½—16
Cocks and faucets	15½—16
Mixed heavy yellow brass	13 —13½
Old rolled brass	14 —14½
Brass pipe	17 —17½
New soft brass clippings	17½—18
Brass rod ends	16½—17
No. 1 brass rod turnings	16 —16½

Aluminum

Alum. pistons and struts	12 —13
Aluminum crankcases	15 —16
2S aluminum clippings	18½—19½
Old sheet and utensils	15 —16
Borings and turnings	12½—13
Misc. cast aluminum	15 —16
Dural clips (24S)	15 —16

Zinc

New zinc clippings	14½—15
Old zinc	11 —11¼
Zinc routings	8½— 9
Old die cast scrap	8 — 8¼

Nickel and Monel

Pure nickel clippings	60 —65
Clean nickel turnings	57 —60
Nickel anodes	60 —65
Nickel rod ends	60 —65
New Monel clippings	22 —25
Clean Monel turnings	18 —20
Old sheet Monel	20 —22
Inconel clippings	26 —28
Nickel silver clippings, mixed	13 —14
Nickel silver turnings, mixed	12 —13

Lead

Soft scrap, lead	15 —15¼
Battery plates (dry)	8¾— 9

Magnesium

Segregated solids	9 —10
Castings	5½— 6½

Miscellaneous

Block tin	90 —100
No. 1 pewter	63 —65
No. 1 auto babbitt	58 —60
Mixed common babbitt	12¼—12½
Solder joints	20 —21
Siphon tops	58 —60
Small foundry type	18¼—18½
Monotype	16¾—17
Lino. and stereotype	16½—16¾
Electrotype	14¾—15
Hand picked type shells	11½—11¾
Lino. and stereo. dross	8 — 8¼
Electro. dross	6½— 6¾

SCRAP *iron and steel*

markets prices trends

OPS finally issues long-expected iron and steel scrap price schedule . . . Rollback to December levels . . . Trading comes to halt.

Cleveland—Buyers were breathing easier this week following Office of Price Stabilization announcement of the long-expected scrap price schedule which at press time had brought trading to an abrupt halt in major scrap markets and generally deadened the market. Effective date of the order is Feb. 7.

Secondary effects of the OPS order will be numerous and varied. Most immediate will be a 30 to 60-day slowup in the movement of tonnage, which will be enough to push some major consumers to the brink of allocations.

Earmarked Tonnage

Also to be expected are more consumer demands on customers for earmarked tonnage, in what will probably be a general effort to screw the lid down on captive scrap and bring it back home.

Consumers like the new prices, a statement which will surprise nobody, but the realists among the buyers are warning that scrap procurement may well become the steel industry's biggest headache.

Most brokers were accepting the OPS order philosophically, but their pleasure at the $1 brokerage was dampened somewhat by the "lack of protection" afforded them by the order. One broker put it this way, "every mill in the country will be doing business with 200 brokers in the next 6 months. Every guy and his brother will become a scrap broker."

Most dealers were satisfied with the order, although some difference of opinion exists as to the fair allowance for the preparation of low phos at $2.50 as compared with $6 for preparing a hydraulic bundle.

With scrap in its present short supply, the effect of the $2 differential between No. 1 and No. 2 heavy melting steel is problematical. If a dealer should, for example ship a car of No. 2 for No. 1 and the mill rejects it, some other mill will probably be glad to take it. This may lead to only one grade, No 1, regardless of what it is.

Prices on the foundry grades represent substantial reductions from recent prices, but according to dealers, the new schedule is much better than the one OPA handed them and the $4 a ton trucking charge will help. Immediate allocation for foundries will probably be necessary.

What apparent inequities presently exist in the order will probably be ironed out leaving only the vital question of supply still to be answered.

In Pittsburgh, both consumers and scrappies are happy that OPS not only listened to but adopted the recommendations they made in pre-control discussions. Some dealers are unhappy over the amount of the rollback.

Some dealers are going to eliminate their most unprofitable items. Most people feel that consumers will not be able to go right out and pick up tonnage. Some claim that the spread between such items as cut and uncut bolsters and side frames and cut and uncut locomotive tires are not sufficient. The trade thinks many will stop preparing these items if they prove unprofitable and that consumers will have to petition Washington to get some adjustment made.

Iron and Steel Scrap Price Schedule

IRON AND STEEL SCRAP

Pursuant to the Defense Production Act of 1950 (Pub. Law 774, 81st Cong.) and Executive Order 10161 (15 F. R. 6105), and in accordance with Economic Stabilization Agency General Order No. 2 (16 F. R. 738), it is hereby ordered that price ceilings on the sale of iron and steel scrap shall be effective as provided in this Ceiling Price Regulation No. .... A statement of the considerations involved in the issuance of this regulation is incorporated hereinafter as Appendix A.

SCOPE OF THE REGULATION

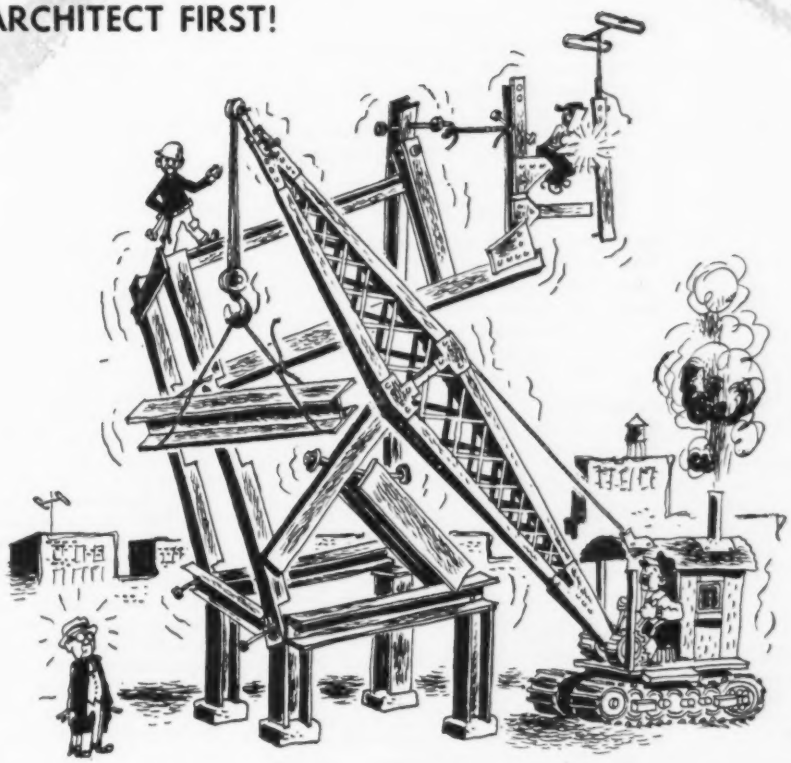
- 1 Prohibitions against dealing in iron and steel scrap at prices above the ceiling.
- 2 Geographical application.

CEILING PRICES

- 3 Basing point prices for steel scrap of dealer and industrial origin.
- 4 Ceiling shipping point prices for steel scrap of dealer and industrial origin.
- 5 Switching charge deductions.
- 6 Ceiling delivered prices for shipment by rail, vessel, or combination thereof, for steel scrap of dealer and industrial origin.
- 7 Basing point prices for steel scrap of railroad origin.
- 8 Ceiling on-line prices for steel scrap of railroad origin.
- 9 Ceiling delivered prices for shipment by rail, vessel, or combination thereof, for steel scrap of railroad origin.

When building is the question...

ASK AN ARCHITECT FIRST!



when STAINLESS is the question

ask KLAFF first

BUYERS of STAINLESS SCRAP
STRAIGHT CHROMES, NICHROME, PURE
NICKEL, NICKEL ALLOYS AND INCONEL

Our 50th Year!

H. KLAFF & COMPANY, INC.

Ostend and Paca Sts., Baltimore 30, Md.

•10 Ceiling prices for railroad steel scrap sold by sellers other than railroads.
•11 Ceiling shipping point and on-line prices for all cast iron scrap.
•12 Ceiling delivered prices for shipment by rail, vessel, or combination thereof, for all cast iron scrap.
•13 Ceiling prices for shipment by truck for all steel or cast iron scrap.

GENERAL PROVISIONS

•14 Unlisted grades.
•15 In transit preparation.
•16 Ceiling preparation charges.
•17 Premiums for alloy content.
•18 Mixed shipments.
•19 Commissions.
•20 Unprepared scrap.
•21 Transportation.
•22 Weights to govern.

SPECIFICATIONS

•23 Steel grades of dealer and industrial origin.
•24 Steel grades of railroad origin.
•25 All cast iron grades.

MISCELLANEOUS PROVISIONS

•26 Imported scrap.
•27 Exported scrap.
•28 Definitions.
•29 Records and reports.
•30 Less than maximum prices.
•31 Evasion.
•32 Enforcement.
•33 Petitions for amendment.
Appendix A Statement of Consideration.

Authority: §§ 312.1 to 312.33 issued under sec. 704, Pub. Law 774, 81st Cong. Interpret or apply Title IV, Pub. Law 774, 81st Cong., E.O. 10161, Sept. 9, 1950, 15 F. R. 6105.

SCOPE OF THE REGULATION

•1 Prohibitions against dealing in iron and steel scrap at prices above the ceiling.

On and after the 7th day of February 1951, regardless of any contract or other obligation:

(a) No person shall sell or deliver iron or steel scrap to a consumer of scrap or his broker at prices higher than the ceiling prices established by this regulation;

(b) No person shall sell, deliver, buy or receive prepared iron or steel scrap at prices higher than the applicable ceiling prices established by this regulation;

(c) No industrial producer or railroad or governmental agency (whether federal, state or local) shall sell or deliver unprepared iron or steel scrap to any person at prices higher than the applicable ceiling prices established by this regulation. No person shall buy or receive unprepared iron or steel scrap from such industrial producer or railroad or governmental agency at prices higher than the applicable ceiling prices established by this regulation;

(d) No consumer of scrap or his broker shall buy or receive iron or steel scrap at prices higher than the ceiling prices established by this regulation;

(e) No person shall export or sell iron or steel scrap to an exporter at prices higher than the ceiling prices established by this regulation;

(f) No person shall charge or pay a fee for the service of preparing iron or scrap in excess of the ceiling preparation charges established by this regulation;

(g) No person shall sell or deliver iron or steel scrap upon condition that the buyer shall sell or deliver to any person any other commodity. No person shall buy or receive iron or steel scrap upon the condition that he shall sell or deliver to any person any other commodity;

(h) No person shall act as both broker and dealer in the purchase of any single lot or item of iron or steel scrap, where the price paid for such lot or item of iron or steel scrap would exceed the applicable ceiling prices established by this regulation;

(i) No person shall agree, offer, solicit or attempt to do any of the foregoing.

•2 Geographical application. This regulation shall apply to sales, deliveries, and preparation of iron or steel scrap in the forty-eight states of the United States and the District of Columbia.

CEILING PRICES

312.3 Basing point prices for steel scrap of dealer and industrial origin.

(a) Basing point prices from which maximum shipping prices are computed.

(1) Basing point prices for the base grade, No. 1 heavy melting steel, Grade 1:

Basing Point:	Price per Gross Ton
Alabama City, Ala.	$ 39.00
Ashland, Ky.	42.00
Atlanta, Ga.	39.00
Bethlehem, Pa.	42.00
Birmingham, Ala.	39.00
Brackenridge, Pa.	44.00
Buffalo, N. Y.	43.00
Butler, Pa.	44.00
Canton, Ohio	44.00
Chicago, Ill.	42.50
Cincinnati, Ohio	43.00
Claymont, Del.	42.50
Cleveland, Ohio	43.00
Coatesville, Pa.	42.50
Conshohocken, Pa.	42.50
Detroit, Mich.	40.00
Duluth, Minn.	40.00
Harrisburg, Pa.	42.50
Houston, Tex.	37.00
Johnstown, Pa.	44.00
Kansas City, Mo.	39.50
Kokomo, Ind.	42.00
Los Angeles, Cal.	35.00
Middletown, Ohio	43.00
Midland, Pa.	44.00
Minnequa, Colo.	38.00
Monessen, Pa.	44.00
Phoenixville, Pa.	42.50
Pittsburg, Calif.	35.00
Pittsburgh, Pa.	44.00
Portland, Ore.	35.00
Portsmouth, Ohio	42.00
St. Louis, Mo.	41.00
San Francisco, Calif.	35.00
Seattle, Wash.	35.00
Sharon, Pa.	44.00
Sparrows Point, Md.	42.00
Steubenville, Ohio	44.00
Warren, Ohio	44.00
Weirton, W. Va.	44.00
Youngstown, Ohio	44.00

(2) Differentials per gross ton above or below the price of Grade 1 (No. 1 heavy melting steel) for other grades of steel scrap.

OPEN HEARTH AND BLAST FURNACE GRADES

Grades		Differentials
2.	No. 2 Heavy Melting Steel	— $ 2.00
3.	No. 1 Busheling	Base
4.	No. 1 Bundles	Base
5.	No. 2 Bundles	— 3.00
6.	Machine Shop Turnings	— 10.00
7.	Mixed Borings and Short Turnings	— 6.00
8.	Shoveling Turnings	— 6.00
9.	No. 2 Bushelings	— 4.00
10.	Cast Iron Borings	— 6.00

ELECTRIC FURNACE AND FOUNDRY GRADES

Grades		Differentials
11.	Billet, Bloom and Forge Crops	+ 7.50
12.	Bar Crops and Plate Scrap	+ 5.00
13.	Cast Steel	+ 5.00
14.	Punchings and Plate Scrap	+ 2.50
15.	Electric Furnace Bundles	+ 2.00
16.	Cut Structural and Plate Scrap 3 ft. and under	+ 3.00
17.	Cut Structural and Plate Scrap 2 ft. and under	+ 5.00
18.	Cut Structural and Plate Scrap 1 ft. and under	+ 6.00
19.	Briquetted Cast Iron Borings	Base
20.	Foundry steel, 2 feet and under	+ 2.00
21.	Foundry steel, 1 foot and under	+ 4.00
22.	Springs and Crankshafts	+ 1.00
23.	Alloy Free Turnings	— 3.00
24.	Heavy Turnings	— 1.00

SPECIAL GRADES

25.	Briquetted Turnings	Base
26.	No. 1 Chemical Borings	— 3.00
27.	No. 2 Chemical Borings	— 4.00
28.	Wrought Iron	+ 10.00
29.	Shafting	+ 10.00

(b) Restrictions on use.

(1) The prices established for Grade 11 (billet, bloom and forge crops), Grade 23 (alloy free turnings) and Grade 24 (heavy turnings) may be charged only when shipped to a consumer directly from an industrial producer of such grades; otherwise the ceiling prices for such grades shall not exceed the prices established for the corresponding grades of basic open hearth and blast furnace scrap.

(2) The prices established for Grade 26 (No. 1 chemical borings) and Grade 27 (No. 2 chemical borings) may be charged only when such grades are sold for use for chemical or annealing purposes; otherwise the ceiling prices for such grades shall not exceed the price established for Grade 10 (cast iron borings).

(3) The price established for Grade 28 (wrought iron) may be charged only when sold to a producer of wrought iron; otherwise the ceiling price for such grade shall not exceed the ceiling price established for the corresponding grade of basic open hearth.

(c) Special pricing provisions. (1) Sellers of Grade 26 (No. 1 chemical borings) and Grade 27 (No. 2 chemical borings) may make an extra charge of $1.50 per gross ton for loading in box cars or 75 cents per gross ton for covering gondola cars with a weather-resistant covering.

(2) The ceiling price of pit scrap, ladle scrap, salamander scrap, skulls, skimmings or scrap recovered from slag dumps and prepared to charging box size, shall be computed by deducting from the price of No. 1 heavy melting steel of dealer and industrial origin, the following amounts:

Where the iron content is 85% and over ..... — $ 4.00
Where the iron content is 75% and over ..... — 6.00
Where the iron content is less than 75% ..... — 10.00

(3) The ceiling price for any inferior grade of iron or steel scrap not listed in section •3 (a) (2) hereof, shall not exceed the price of No. 1 heavy melting steel less $15.00.

•4 Ceiling shipping point prices for steel scrap of dealer and industrial origin. (a) For shipping points located within a basing point named in section •3 hereof, the ceiling shipping point price for any grade of steel scrap shall be the price established at such basing point, minus the applicable switching charge deduction set forth in section •5 hereof.

(b) For shipping points located outside the basing points named in section •3 hereof, the ceiling shipping point price of any grade of iron or steel scrap shall be the price established for the scrap at the most favorable basing point, minus the lowest established charge for transporting scrap from the shipping point to such basing point by rail or water carrier, or combination thereof. (The most favorable basing point is the basing point named in section •3 hereof which will yield the highest shipping point price.)

(c) Where water rates are involved in the computations under subsection (b) the following additional deductions must be made. A flat charge of $1.25 per gross ton for dock charges, except, however, that at Memphis, Tennessee, the deduction shall be 95 cents per gross ton; at Great Lakes ports, $1.50 per gross ton; and at New England ports, $1.75 per gross ton.

Where the shipping point is located outside of the switching district of the city from which the water rate is applicable, the lowest established charge for transporting scrap by rail from the shipping point to the f.a.s. vessel point must be deducted. No deduction for switching charges need be made where the shipping point is located within the switching district of the city from which the water rate is applicable. If there is no established charge for transporting scrap by rail from the shipping point to the f.a.s. vessel point, water rates may not be used in computing shipping point prices.

(d) The ceiling shipping point price for No. 1 heavy melting steel (with differentials established in section •3 hereof for all other grades) at all shipping points in New York City (or Brooklyn, New York) shall be $36.99 per gross ton.

(e) Ceiling shipping point prices at all shipping points in Hudson and Bergen Counties, New Jersey, shall be computed from the Bethlehem, Pa., basing point.

(f) Ceiling shipping point prices at all shipping points in the State of New Jersey shall be computed by the use of all rail transportation charges.

(g) The ceiling shipping point price for No. 1 heavy melting steel (with differentials established in section •3 hereof for all other grades) need not fall below $32.00 per gross ton.

•5 Switching charge deductions. The switching charges to be deducted from the basing point price of dealer and industrial scrap as set forth in section •3 hereof, or the basing point price of non-operating railroad scrap, as set forth in section •7 hereof, in order to determine the ceiling shipping point prices for such scrap originating in basing points, are as follows:

(a) Basing point:	Dollars per Gross Ton
Alabama City, Ala.	$ .43
Ashland, Ky.	.47
Bethlehem, Pa.	.52
Birmingham, Ala.	.50
Brackenridge, Pa.	.53
Buffalo, N. Y.	.83
Butler, Pa.	.65
Atlanta, Ga.	.51
Canton, Ohio	.51
Chicago, Ill.	1.34
Cincinnati, Ohio	.65
Claymont, Del.	.79
Cleveland, Ohio	.76
Coatesville, Pa.	.50
Conshohocken, Pa.	.20
Detroit, Mich.	.95
Duluth, Minn.	.50
Harrisburg, Pa.	.51
Houston, Tex.	.57
Johnstown, Pa.	.75
Kansas City, Mo.	.78
Kokomo, Ind.	.51
Los Angeles, Cal.	.66
Middletown, Ohio	.26
Midland, Pa.	.75
Minnequa, Colo.	.33
Monessen, Pa.	.51
Phoenixville, Pa.	.51
Pittsburg, Calif.	.65
Pittsburgh, Pa.	.99
Portland, Ore.	.52
Portsmouth, Ohio	.51
St. Louis, Mo.	.51
San Francisco, Cal.	.66
Seattle, Wash.	.59
Sharon, Pa.	.75
Sparrows Point, Md.	.20
Steubenville, Ohio	.51
Warren, Pa.	.75
Weirton, W. Va.	.70
Youngstown, Ohio	.75

(b) The Pittsburgh, Pa., basing point includes the switching districts of Bessemer, Homestead, Duquesne and Munhall, Pa.

(c) The Cincinnati, Ohio, basing point includes the switching district of Newport, Ky.

(d) The St. Louis, Mo., basing point includes the switching districts of Granite City, East St. Louis and Madison, Ill.

(e) The San Francisco, Cal., basing point includes the switching districts of South San Francisco, Niles and Oakland, Cal.

(f) The Claymont, Delaware, basing point includes the switching districts of Chester, Pa.

(g) The Chicago, Ill., basing point includes the switching district of Gary, Ind.

(h) The Los Angeles, Cal., basing point includes the Firestone switching district.

•6 Ceiling delivered prices for shipment by rail, vessel, or combination thereof, for steel scrap of dealer and industrial origin. (a) The ceiling delivered price of any grade of steel scrap delivered by rail, vessel, or combination thereof, shall be the shipping point price as determined in section •4 hereof, plus the actual charge for transporting the scrap from the shipping point to the point of delivery by the means of transportation employed.

(b) If delivery to the consumer involves vessel movement, the actual charges incurred at a public dock may be added to the actual transportation charges. Where the dock facilities are owned or controlled by the shipper of the scrap, a maximum charge of $1.25 per gross ton may be added to the actual transportation charges; except that the maximum charge shall be 95 cents per gross ton at Memphis, Tenn., $1.50 per gross ton at any Great Lakes port, or $1.75 per gross ton at any New England port.

(c) In the case of water movement by deck scow or railroad lighter, no established charges at the dock or any charge or cost customarily incurred at the dock may be included in the delivered price. In lieu thereof a maximum charge of $1.25 per gross ton may be included in the delivered price.

•7 Basing point prices for steel scrap of railroad origin. (a) Basing point prices from which ceiling on-line and ceiling delivered prices are computed.

(1) Basing point prices for the base grade. No. 1 railroad heavy melting steel. Grade 1:

	Price per Gross Ton
Alabama City, Ala.	$ 41.00
Ashland, Ky.	44.00
Atlanta, Ga.	41.00
Bethlehem, Pa.	44.00
Birmingham, Ala.	41.00
Brackenridge, Pa.	46.00
Buffalo, N. Y.	45.00
Butler, Pa.	46.00
Canton, Ohio	46.00
Chicago, Ill.	44.50
Cincinnati, Ohio	45.00
Claymont, Del.	44.50
Cleveland, Ohio	45.00
Coatesville, Pa.	44.50
Conshohocken, Pa.	44.50
Detroit, Mich.	42.00
Duluth, Minn.	42.00
Harrisburg, Pa.	44.50
Houston, Tex.	39.00
Johnstown, Pa.	46.00
Kansas City, Mo.	41.50
Kokomo, Ind.	44.00
Los Angeles, Cal.	37.00
Middletown, Ohio.	45.00
Midland, Pa.	46.00
Minnequa, Colo.	40.00
Monesen, Pa.	46.00
Phoenixville, Pa.	44.50
Pittsburg, Cal.	37.00
Pittsburgh, Pa.	46.00
Portland, Ore.	37.00
Portsmouth, Ohio	44.00
St. Louis, Mo.	43.00
San Francisco, Cal.	37.00
Seattle, Wash.	37.00
Sharon, Pa.	46.00
Sparrows Point, Md.	44.00
Steubenville, Ohio	46.00
Warren, Ohio	46.00
Weirton, W. Va.	46.00
Youngstown, Ohio	46.00

(2) Differentials per gross ton above or below the price of Grade 1 (No. 1 railroad heavy melting steel) for other grades of railroad steel scrap:

Grades	Differentials
2. No. 2 Heavy Melting Steel	— $ 2.00
3. No. 2 Steel Wheels	Base
4. Hollow Bored Axles	Base
5. No. 1 Busheling	— 3.50
6. No. 1 Turnings	— 3.00
7. No. 2 Turnings, Drillings and Borings	— 12.00
8. No. 2 Cast Steel	— 6.00
9. Uncut Frogs and Switches	Base
10. Flues, Tubes and Pipes	— 8.00
11. Structural, Wrought Iron and/or Steel, Uncut	— 6.00
12. Destroyed Steel Cars	— 8.00
13. No. 1 Sheet Scrap	— 9.50
14. Scrap Rails, Random Lengths	+ 2.00
15. Rerolling Rails	+ 7.00
16. Cut Rails, 3 feet and under	+ 5.00
17. Cut Rails, 2 feet and under	+ 6.00
18. Cut Rails, 18 inches and under	+ 8.00
19. Cast Steel No. 1	+ 3.00
20. Uncut Tires	+ 2.00
21. Cut Tires	+ 5.00
22. Uncut Bolsters and Side Frames	Base
23. Cut Bolsters and Side Frames	+ 3.00
24. Angle and Splice Bars	+ 5.00
25. Solid Steel Axles	+ 12.00
26. Steel Wheels, No. 3 Oversize	Base
27. Steel Wheels, No. 3	+ 5.00
28. Spring Steel	+ 5.00
29. Couplers and Knuckles	+ 5.00
30. Wrought Iron	+ 8.00

Bills of Lading

Pittsburgh — The Economic Stabilization Agency stated that ceiling prices on scrap will apply on bills of lading dated subsequent to effective date of the order which is 12.01 A. M., Wednesday, Feb. 7. Date of actual delivery to the consumer's mill or foundry is not a factor.

(b) **Restrictions on use.** (1) The price established for grade 15 (rerolling rails) may be charged only when purchased and sold for rerolling use; otherwise, the ceiling price for such grade shall not exceed the ceiling price established for grade 14 (scrap rails in random lengths). (The term "rerolling rails" includes any rails which are sold to be used for rerolling, irrespective of whether or not such rails are usable for relaying.)

(2) The price established for grade 30 (Wrought Iron) may be charged only when sold to a producer of Wrought Iron; otherwise, the ceiling price for such grade shall not exceed the ceiling price established for the base grade, No. 1 railroad heavy melting steel.

•8. **Ceiling on-line prices for steel scrap of railroad origin.** The term "on-line prices" means the ceiling prices that the originating railroad may charge for scrap delivered to a consumer located on the line of the railroad.

(a) **On-line prices for operating railroads operating in a basing point.** The ceiling on-line price of any grade of steel scrap originating from an operating railroad operating in a basing point name in section •7 hereof shall be the price established in that section for the scrap at the highest priced basing point in which the railroad operates.

(b) **On-line prices for operating railroads not operating in a basing point.** The ceiling on-line price of any grade of steel scrap originating from an operating railroad not operating in a basing point named in section •7 hereof shall be the price established for the scrap at the most favorable basing point named in that section minus the foreign line proportion of the lowest established charge for transporting scrap by rail from the scrap accumulation point of the railroad to such basing point. (The "scrap accumulation point" shall be that point from which the greatest tonnage of scrap was shipped in the calendar year, 1950). The ceiling on-line price of No. 1 railroad heavy melting steel need not fall below $34.00 per gross ton (with differentials established in section •7 hereof for all other grades).

The "most favorable basing point" is the basing point named in section •7 hereof which will yield the highest ceiling on-line price.

On and after the effective date of this regulation, no operating railroad not operating in a basing point named in section •7 hereof may sell or offer to sell iron and steel scrap to a consumer or his broker (without obtaining prior written approval from the Office of Price Stabilization) unless it has filed with the Office of Price Stabilization, Washington 25, D. C., a statement in writing setting forth its ceiling on-line price for No. 1 railroad heavy melting steel and describing the method by which the said ceiling on-line price was calculated and such statement has been approved in writing by the Office of Price Stabilization, Washington, D. C. The statement shall include: the most favorable basing point selected, the price at such basing point, the location of the scrap accumulation point, the lowest established charge for transporting scrap by rail from such accumulation point to the named basing point, and the foreign line proportion of such lowest established charge.

(c) **Non-operating railroad.** (1) The ceiling on-line (or shipping point) price of any grade of steel scrap originating from a non-operating railroad shall be the price established for the scrap at the most favorable basing point named in section •7 hereof minus the lowest established charge for transporting scrap by rail from the scrap accumulation point of the railroad to such basing point. (The "scrap accumulation point" shall be that point from which the greatest tonnage of scrap was shipped in the calendar year 1950; except, that the non-operating railroad may be permitted to use more than one accumulation point upon filing with the Office of Price Stabilization notice thereof showing the tonnage shipped from such additional point during 1950). The ceiling on-line price of No. 1 railroad heavy melting steel need not fall below $34.00 per gross ton (with differentials established in section •7 hereof for all other grades). The "most favorable basing point" is the basing point named in section •7 hereof which will yield the highest ceiling on-line or shipping point price.

(2) Where the non-operating railroad is located within a basing point set forth in section •7 hereof, the switching charge deductions established in section •5 hereof shall be applicable.

312.9 **Ceiling delivered prices for shipment by rail, vessel, or combination thereof, for steel scrap of railroad origin.** (a) **When delivered to a consumer located on the line of a railroad.** The ceiling delivered price of any grade of steel scrap originating from an operating railroad and delivered to a consumer's plant located on the line of that railroad shall be the ceiling on-line price established in section •8 hereof.

(b) **When delivered to a consumer located off the line of the originating railroad.** The ceiling delivered price of any grade of steel scrap originating from an operating railroad and delivered to a consumer located off the line of that railroad, by rail, vessel or combination thereof, shall be the ceiling on-line price established in section •8 hereof, plus the foreign line proportion of the through rate from the point of shipment to the consumer's plant via the junction nearest such plant in terms of transportation charges, or the commercial rate from such nearest junction to the consumer's plant (unless off-line routing at another point is directed by order of a government agency). In no case may a railroad seller participate in the transportation charges incurred in off-line delivery of scrap unless the ceiling on-line price for the scrap is reduced by the amount of the participation in the off-line charges.

(c) **When delivered to a consumer from a non-operating railroad.** The ceiling delivered price of any grade of steel scrap originating from a non-operating railroad shall be the ceiling price established in section •8 (c) hereof, plus transportation charges to the point of delivery. Such transportation charges shall be computed in the same manner as charges allowable under section •6 or •15 hereof for dealer of industrial scrap.

•10 **Ceiling prices for railroad steel scrap sold by sellers other than railroads.** (a) Railroad steel scrap prepared by a dealer or moving through a dealer's yard (except for unprepared scrap prepared in-transit pursuant to section •15 hereof or sold by any other person than a railroad as defined in this regulation, shall be classified and priced under sections •3 and •4 hereof except that for Grades Nos. 3, 4, 8, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26 and 27 of steel scrap set forth in section •7(a)(2) hereof the ceiling shipping point prices shall be the same as those established for non-operating railroads in section •8(c) hereof, and the ceiling delivered prices shall be the same as those established for non-operating railroads in section •9(c) hereof.

(b) Where a dealer or contractor demolishes railroad equipment on the property of, or in a yard provided exclusively for that purpose by the railroad awarding the contract, the resultant railroad scrap may be sold at prices not in excess of the ceiling prices established in section •8(c) hereof for non-operating railroads; **Provided, That** in each case the dealer or contractor awarded such contract by a railroad reports to the Office of Price Stabilization, Washington 25, D. C., within 7 days after the award of the contract the name of the selling railroad, the type of equipment involved, the location at which demolition will take place, and the estimated tonnage of each grade of scrap resulting; also such other relevant information as he considers necessary or advisable to explain the transaction.

•11 **Ceiling shipping point and ceiling on-line prices for all cast iron scrap.** (a) The ceiling price per gross ton for any of the following grades of cast iron scrap shall be the price shown in the following table, f.o.b. the shipping point:

Grades	Price per Gross Ton
1. Cast iron No. 1 (cupola cast)	$ 49.00
2. Cast iron No. 2 (charging box cast)	47.00
3. Cast iron No. 3 (heavy breakable cast)	45.00
4. Cast iron No. 4 (burnt cast)	41.00
5. Cast iron brake shoes	41.00
6. Stove plate	46.00
7. Clean auto cast	52.00
8. Unstripped motor blocks	43.00
9. Wheels No. 1	47.00
10. Malleable	55.00
11. Drop broken machinery casts	52.00

(b) **Restrictions on use.** (1) The ceiling shipping point or on-line price which a basic open hearth consumer may pay for cast iron No. 1 (cupola cast), wheels No. 1, clean auto cast or malleable shall be the ceiling price established for cast iron No. 3 (heavy breakable cast).

(2) The ceiling shipping point or on-line price which any foundry consumer other than a malleable iron producer may pay for Grade 10 (malleable) shall be the ceiling price established for cast iron No. 1 (cupola cast).

•12 **Ceiling delivered prices for shipment by rail, vessel, or combination thereof, for all cast-iron scrap.** (a) The ceiling delivered price for shipment by rail, vessel, or combination thereof of any grade of cast iron scrap of dealer or industrial origin shall be the shipping point price as determined in section •11 hereof plus the actual charge for transporting the scrap from the shipping point to the point of delivery by the means of transportation employed. If delivery to the consumer involves water movement the actual charges incurred at a public dock may be added to the actual transportation charges. Where the dock facilities are owned or controlled by the shipper of the cast iron scrap, the following maximum dock charges may be added to the actual transportation charges: At Memphis, Tenn., 95 cents per gross ton; at any Great Lakes port, $1.50 per gross ton; at all New England ports, $1.75 per gross ton; and at all other ports, $1.25 per gross ton.

•13 **Ceiling delivered prices for shipment by truck for all steel or cast iron scrap.** (a) Where delivery of any grade of iron or steel scrap is made by public carrier truck, the ceiling delivered price shall be the ceiling shipping point price, or in the case of railroad scrap, the ceiling on-line price, as established in section •4, •8, •10 or •11 hereof, whichever is applicable, plus the actual public carrier charge.

(b) Where delivery of any grade of iron or steel scrap is made in a truck owned or controlled by the shipper or broker of the scrap, the ceiling delivered price shall be the ceiling shipping point price, or in the case of railroad scrap, the ceiling on-line price, as established in section •4, •8, •10 or •11 hereof, whichever is applicable, plus the established rail carload freight rate for shipping scrap from the rail siding nearest the point of delivery, except that, the transportation charge for delivering any grade of iron or steel scrap in a truck owned or controlled by the

shipper shall not be in excess of $4.00 and need not fall below $2.50 per gross ton.

General Provisions

•14 **Unlisted grades.** If the seller is unable to determine a ceiling price for any grade of iron or steel scrap under the applicable provisions hereof (which, in the opinion of the Director of Price Stabilization, provided adequate pricing instructions for all recognized grades), he shall file an application for approval of a ceiling price with the Office of Price Stabilization, Washington 25, D. C. The application shall set forth: (1) a complete description of the material, and (2) the ceiling price being requested.

The seller may not deliver or sell at his requested price until he has received written approval of the price from the Office of Price Stabilization.

•15. **Intransit preparation.** (a) A consumer may designate a dealer or dealers to prepare steel scrap of dealer and industrial origin intransit on a preparation fee basis under one of the following circumstances:

(1) Where unprepared steel scrap of dealer and industrial origin is allocated for preparation intransit by the National Production Authority.

(2) Where a consumer purchases unprepared scrap of dealer and industrial origin in rail carload lots.

(3) Where Grade 6 (machine shop turnings) or other grades of long or bushy turnings are allocated by the National Production Authority in rail carload lots to a consumer, or where a consumer purchases such turnings in rail carload lots for crushing.

(4) Where Grade 10 (cast iron borings) is allocated by the National Production Authority to a consumer for briquetting.

(b) A consumer may designate a dealer or dealers to prepare steel scrap of railroad origin intranst on a preparation fee basis only where a consumer without adequate preparation facilities purchases unprepared steel scrap from an originating railroad.

(c) A consumer may designate a dealer or dealers to prepare cast iron scrap intransit on a preparation fee basis where such consumer is without adequate preparation facilities.

(d) No fee may be paid to the person preparing scrap intransit pursuant to the provisions of this section if the scrap originates in the preparer's yard or if title to the scrap resides in the preparer at any time after the scrap leaves its shipping point, unless such scrap is allocated by the National Production Authority.

(e) The maximum preparation fee for preparing any grade of iron or steel scrap intransit shall be the applicable fee established in section •16 hereof.

(f) Whenever intransit preparation of iron or steel scrap is permissible pursuant to the provisions of this section, the ceiling delivered price shall be the ceiling shipping point price or ceiling on-line price for unprepared scrap plus the rail transportation charges incurred in moving the scrap to the point of preparation, plus the applicable ceiling preparation fee as established in section •16 hereof, plus the transportation charges from the preparation yard to the point of delivery as established and restricted in section •6, •9, •12 or •13 hereof, whichever is applicable.

•16 **Ceiling preparation charges.** (a) The ceiling fees which may be charged for intransit preparation of any grade of steel scrap of dealer or industrial origin which is allocated by the National Production Authority to a consumer, shall be as follows:

(1) For preparing into Grade No. 1 (No. 1 heavy melting steel), Grade No. 2 (No. 2 heavy melting steel) or Grade No. 3 (No. 1 busheling), $8.00 per gross ton.

(2) For hydraulically compressing Grade No. 4 (No. 1 bundles), $6.00 per gross ton or Grade No. 5 (No. 2 bundles), $8.00 per gross ton.

(3) For crushing Grade No. 6 (machine shop turnings), $3.00 per gross ton.

(4) For preparing into Grade No. 25 (briquetted turnings), $6.00 per gross ton.

(5) For preparing into Grade No. 19 (briquetted cast iron borings), $6.00 per gross ton.

(6) For preparing into Grade No. 12 (bar crops and plate scrap), Grade No. 13 (cast steel), Grade No. 14 (punchings and plate scrap), or Grade No. 18 (cut structural and plate scrap, 1 foot and under), $10.00 per gross ton.

(7) For preparing into Grade No. 17 (cut structural and plate scrap, 2 feet and under) or Grade No. 21 (foundry steel, 1 foot and under), $10.00 per gross ton.

(8) For preparing into Grade No. 16 (cut structural and plate scrap, 3 feet and under), or Grade No. 20 (foundry steel, 2 feet and under), $10.00 per gross ton.

(9) For hydraulically compressing Grade No. 15 (electric furnace bundles), $8.00 per gross ton.

(10) For preparing into Grade No. 28 (wrought iron), $10.00 per gross ton.

(b) The ceiling fees which may be charged for intransit preparation of any grade of steel scrap of railroad origin shall be as follows:

(1) For preparing into Grade No. 1 (No. 1 railroad heavy melting steel) and Grade No. 2 (No. 2 railroad heavy melting steel), $8.00 per gross ton.

(2) For hydraulically compressing Grade No. 13 (No. 1 sheet scrap), $6.00 per gross ton.

(3) For preparing into Grade No. 16 (Cut Rails, 3 feet and under), $4.00 per gross ton.

(4) For preparing into Grade No. 17 (Cut Rails, 2 feet and under), $5.00 per gross ton.

(5) For preparing into Grade No. 18 (Cut Rails, 18 inches and under), $7.00 per gross ton.

(6) For preparing into Grade No. 21 (cut tires), $4.00 per gross ton.

(7) For preparing into Grade No. 23 (cut Bolsters and side Frames), $4.00 per gross ton.

(c) The ceiling fees which may be charged for intransit preparation of cast iron shall be limited to the following:

For preparing Grade No. 8 (unstripped motor blocks) into Grade No. 7 (clean auto cast), $9.00 per gross ton, and Grade No. 3 (heavy breakable cast) into Grade No. 1 (cast iron No. 1), $4.00 per gross ton.

(d) Whenever scrap has arrived at its point of delivery and the consumer engages a dealer to prepare such scrap, no fee may be charged or paid for such service unless the consumer obtains prior written approval from the Office of Price Stabilization, Washington 25, D. C.

(e) No preparation charge other than the charges set forth in this section may be made for the preparation of any grade of iron or steel scrap unless the consumer has secured prior written approval of such charge from the Office of Price Stabilization, Washington 25, D. C.

•17 **Premiums for alloy content.** With the exception of the premium specifically authorized in this section no premium may be charged for alloys contained in iron or steel scrap. Except as outlined below the premiums are not confined to a particular use.

(a) **Nickel.** A premium of $1.25 per gross ton for each ¼ of 1 pct may be charged in addition to the applicable ceiling price for No. 1 heavy melting steel where the scrap contains not less than 1 pct and not over 5.25 pct nickel.

(b) **Molybdenum.** A premium of $2.00 per gross ton may be charged in addition to the applicable ceiling price for No. 1 heavy melting steel for scrap containing not less than .15 pct molybdenum. A premium of $3.00 per gross ton may be charged in addition to the applicable ceiling price for No. 1 heavy melting steel for scrap containing not less than .65 pct molybdenum.

(c) **Manganese.** A premium of $4.00 per gross ton over the applicable basing point price for No. 1 heavy melting steel or No. 1 railroad heavy melting steel may be charged where scrap contains not less than 10 pct manganese and is in sizes larger than 12 x 24 x 8 inches. A premium of $14.00 per gross ton over the applicable basing point price for No. 1 heavy melting steel or No. 1 railroad heavy melting steel may be charged where scrap contains not less than 10 pct manganese and is cut to sizes of 12 x 24 x 8 inches or smaller. The manganese premiums provided in this paragraph (c) are only applicable if the scrap is sold for electric furnace use except on allocation by the National Production Authority.

(d) **Silicon.** The adjustments established under section •4 hereof for electric furnace, and foundry grades shall not be applicable if the scrap contains silicon between .5 pct and 1.75 pct.

(e) **Chromium.** Steel scrap conforming to SAE 52100 may command a premium of $1.00 per gross ton in addition to the applicable ceiling price for the corresponding grade when sold for electric furnace use only, but in no event shall the ceiling price plus the premium provided herein exceed the ceiling price for No. 1 heavy melting steel plus $1.00.

(f) **Multiple alloys.** Where any grade of scrap contains two alloy elements for which premiums have been established in this section, the total premiums may not exceed the ceiling premium for any one contained alloy.

•18 **Mixed shipments.** When grades of scrap commanding different ceiling prices under the provisions of this regulation are included in one vehicle, the ceiling price shall be the applicable ceiling price in section •4, •8, •10 or •11 hereof for the lowest grade contained in the vehicle, except when the grades are invoiced as separate grades and the grades are so loaded in the vehicle that they can readily be distinguished and separately weighed.

•19 **Commissions.** (a) No commission shall be payable on sales made under this regulation except by a consumer to a broker for brokerage services rendered to the consumer. Where scrap is allocated by the National Production Authority other than from a government agency, the seller may designate a broker. Where scrap is allocated by the National Production Authority from a governmental agency, the consumer may designate a broker. In the event that a broker purchases iron or steel scrap for sale to a consumer, such consumer may pay such broker a commission not exceeding $1.00 per gross ton. No commission shall be payable unless:

(1) The broker is regularly and primarily engaged in the business of buying and selling iron and steel scrap;

(2) The broker guarantees the quality and delivery of an agreed tonnage of scrap;

(3) The scrap is purchased by the consumer at a price no higher than the ceiling prices established in this regulation;

(4) The broker sells the scrap to the consumer at the same price, with the same

discounts and allowances, at which he purchased it, and does not include in the shipping point price any cost, fee, or charge incurred in placing the scrap at its shipping point;

(5) The broker does not split or divide the commission in whole or in part, with the seller or sellers of the scrap, or with another broker, or sub-broker, or with the consumer;

(6) The commission is shown as a separate item on the invoice.

(b) No commission shall be payable to a person for scrap which he prepares.

(c) No commission shall be payable to a person controlling, or holding directly or indirectly a substantial financial interest in the person preparing the scrap, or to a person employed or controlled by the person preparing the scrap, or to a person in whom the person preparing the scrap holds directly or indirectly a substantial financial interest or control.

•20 **Unprepared scrap.** (a) The term "unprepared scrap" shall have its customary trade meaning and shall not include such demolition projects as bridges, box cars or automobiles, which must be so priced that the prepared scrap will be delivered to the consumer within the ceiling delivered prices established by this regulation.

(b) For unprepared steel scrap other than materials suitable for hydraulic compression, the ceiling basing point prices shall be $8.00 per gross ton beneath the price of the prepared base grades, No. 1 heavy melting steel or No. 1 railroad heavy melting steel, as established in section •3 or •7.

(c) For unprepared material which when compressed constitutes No. 1 bundles the ceiling basing point price shall be $6.00 per gross ton beneath the ceiling basing point price for No. 1 bundles or when compressed constitutes No. 2 bundles the ceiling basing point price shall be $8.00 per gross ton beneath the ceiling basing point price for No. 2 bundles, as established in section •3 hereof.

(d) Any iron casting which cannot be broken with an ordinary drop into Grade No. 2 (cast iron No. 2) or Grade No. 1 (cast iron No. 1) as established in section •11 hereof may not be classified as Grade No. 3 (cast iron No. 3). Where such iron casting requiring blasting or other special preparation is sold to a consumer of scrap, the shipping point price for Grade No. 3 (cast iron No. 3) as established in section •11 hereof must be reduced by the amount of the additional charges required for preparation.

•21 **Transportation charges.** (a) The rail or vessel charges, or combination rail-vessel charges, used in computing ceiling shipping point or ceiling on-line prices in section •4 or •8 hereof need not reflect any increase in rates which became effective after January 1, 1951, nor need such charges reflect any transportation tax.

(b) Any tax imposed upon the transportation charges from the shipping point to the point of delivery, may be included in the ceiling delivery price.

(c) No vessel charge shall be deemed an established charge within the provisions of this regulation unless regular vessel movement of scrap, except for seasonal restrictions, is being made to the most favorable basing point as of the effective date of this regulation, as a customary business practice.

(d) Where rail or vessel charges vary because of seasonal factors, the lowest established charge shall be the lowest charge in effect at any time during the year.

•22 **Weights to govern.** (a) Except as otherwise provided in this section, settlement for all scrap shall be made on the basis of weights at the point of delivery.

(b) **Rail shipments.** If the consumer is a member of a weighing association, settlement shall be on the basis of mill weights. If the consumer does not have weighing facilities, settlement shall be made on the basis of railroad weights at the point of delivery.

No adjustment need be made for shortages of 500 pounds or less per car between shipping point weights and weights at the point of delivery. If the shortage exceeds 500 pounds per car, adjustment must be made for the full shortage.

(c) **Vessel shipment.** When shipment is wholly or partially by vessel, weights at the dock prior to vessel movement shall govern. If the scrap moves from the shipping point to the dock by rail and weights at the shipping point have been determined, no adjustment need be made for differences of 500 pounds or less per car between shipping point weights and weights at the dock. If the difference exceeds 500 pounds per car, adjustment must be made for the full shortage in the car.

(Provisions 23 through 25 give specifications of all grades of scrap.)

Miscellaneous Provisions

•26 **Imported scrap.** (a) This Ceiling Price Regulation No. is not applicable to imported scrap as defined in section •28(f) hereof.

•27 **Exported scrap.** The ceiling price for any grade of iron or steel scrap sold for export or to an exporter shall be the ceiling shipping point or on-line price as established in section •4, •8, •10 or •11 hereof, whichever is applicable, plus all transportation charges allowable under the appropriate section, to the place of export. For scrap exported by vessel, this ceiling export price shall be f.a.s. vessel at the place of export, and the actual cost incidental to shipment and export from that point may be added, if shown as separate charge on the invoice.

•28 **Definitions.** (a) "Person" includes an individual, corporation, partnership, association, or any other organized group of persons or legal successor or representative of any of the foregoing, and includes the United States or any agency thereof, or any other government, or any of its political subdivisions, or any agency of any of the foregoing.

(b) "Iron and steel scrap" means all ferrous materials, either alloyed or unalloyed, of which iron or steel is a principal component, which are the waste of industrial fabrication, or objects that have been discarded on account of obsolescence, failure or any other reason, when sold to a consumer as defined in paragraph (c) of this section, or his broker.

(c) "Consumer means a purchaser of iron or steel scrap for use in the production of iron or steel products by melting or rerolling; or any person purchasing iron or steel scrap for use as a reduction agent in the production of chemicals or pigments, for use in the production of non-ferrous materials, for use as ballast or counterweights, or for annealing; and includes any governmental agency or subdivision.

(d) "Operating railroad" means a railroad, terminal association, or switching company which operates a railway line and derives at least a portion of its revenue from the carrying of freight.

(e) "Non-operating railroad" means all railroads other that operating railroads, as defined in paragraph (d) of this section, and includes suburban and interurban electric railroads, street railways, refrigerator car, stock car, sleeping car and tank car companies engaged primarily in the transportation business, but does not include mine or logging roads.

(f) "Imported scrap" means all iron and steel scrap having a point of origin outside the 48 states of the United States and the District of Columbia.

(g) "Free of alloys" means that any alloys contained in the steel are residual and have not been added for the purpose of making an alloy steel. Steel scrap will be considered free of alloys where the residual alloying elements do not exceed the following amounts:

Nickel	0.45
Chromium	.20
Molybdenum	.10
Manganese	1.65

and where the combined residuals other than the manganese do not exceed a total of .60 pct.

(h) "Lowest established charge." The term shall mean the rail or vessel freight rate for transporting material generally classified as iron or steel scrap and shall not refer to freight charges for transporting any special grade thereof even though the latter grade is actually being shipped.

(i) "Shipping point." Scrap is at its shipping point in the case of all rail, rail-vessel, rail-truck or truck-rail movement when it has been placed f.o.b. railroad cars for shipment to the consumer; in the case of all-vessel, vessel-rail or vessel-truck movement, when it has been placed f.a.s. vessel for shipment to the consumer; and, in the case of all-truck movement, when it has been placed f.o.b. truck for shipment to the consumer.

(j) "Point of delivery" shall mean that point at which scrap has arrived for unloading at the plant of the consumer.

(k) "Dealer and industrial origin" shall mean all sources of scrap other than railroads as defined in this regulation.

(l) "Scrap accumulation point" shall be that point from which the greatest tonnage of scrap was shipped in the calendar year 1950.

(Provisions 29 through 33 deal with records and reports, below ceiling prices, evasion and enforcement of the order, and petitions for amendment.)

Scrap Prices Hold

New York—Restrained by the general price freeze order and the pending price rollback regulation, scrap prices in all markets were unchanged from last week to Tuesday, Feb. 6, with the exception of two minor price dips in Birmingham and some upward price revisions for Seattle.

In Birmingham, No. 1 RR. heavy melting dropped from last week's $43 to $44 down to $42.50 to $43.50 and No. 1 cupola cast lost $1, becoming $53 to $54. The Seattle price of No. 1 heavy rose to $35; No. 2 heavy, $35; electric furnace 1 ft and under, $50; and No. 1 cupola cast, $45 to $50.

For the Purchase or Sale of

Iron and Steel Scrap . . .

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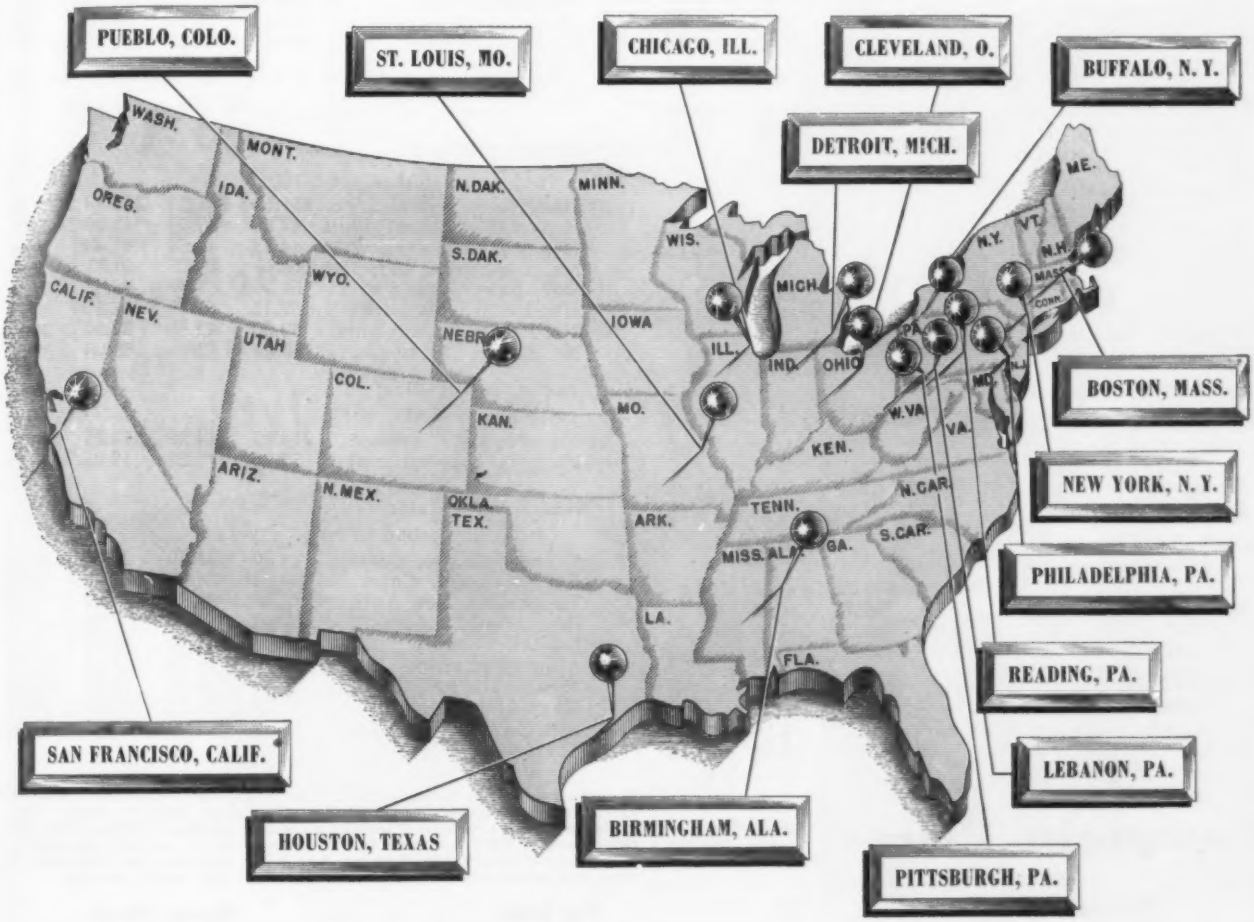

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ST. LOUIS, MO. 2110 Railway Exchange Bldg.		SAN FRANCISCO, CAL. Pacific Gas & Elec. Co. Bldg.	

LEADERS IN IRON AND STEEL SCRAP SINCE 1889

Comparison of Prices

Steel prices in this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Flat-Rolled Steel: (cents per pound)	Feb. 6, 1951	Jan. 30, 1951	Jan. 9, 1951	Feb. 7 1950
Hot-rolled sheets	3.60	3.60	3.60	3.35
Cold-rolled sheets	4.35	4.35	4.35	4.10
Galvanized sheets (10 ga)	4.80	4.80	4.80	4.40
Hot-rolled strip	3.50	3.50	3.50	3.25
Cold-rolled strip	4.75	4.75	4.75	4.21
Plate	3.70	3.70	3.70	3.50
Plates wrought iron	7.85	7.85	7.85	7.85
Stains C-R-strip (No. 302)	36.50	36.50	36.50	33.00
Tin and Terneplate: (dollars per base box)				
Tinplate (1.50 lb) cokes.	$7.50	$7.50	$7.50	$7.50
Tinplate, electro (0.50 lb)	6.60	6.60	6.60	6.60
Special coated mfg. ternes	6.35	6.35	6.35	6.50
Bars and Shapes: (cents per pound)				
Merchant bars	3.70	3.70	3.70	3.45
Cold finished bars	4.55	4.55	4.55	*4.145
Alloy bars	4.30	4.30	4.30	3.95
Structural shapes	3.65	3.65	3.65	3.40
Stainless bars (No. 302)	31.25	31.25	31.25	28.50
Wrought iron bars	9.50	9.50	9.50	9.50
Wire: (cents per pound)				
Bright wire	4.85	4.85	4.85	4.50
Rails: (dollars per 100 lb)				
Heavy rails	$3.60	$3.60	$3.60	$3.40
Light rails	4.00	4.00	4.00	3.75
Semifinished Steel: (dollars per net ton)				
Rerolling billets	$56.00	$56.00	$56.00	$54.00
Slabs, rerolling	56.00	56.00	56.00	54.00
Forging billets	66.00	66.00	66.00	63.00
Alloy blooms billets, slabs	70.00	70.00	70.00	66.00
Wire Rod and Skelp: (cents per pound)				
Wire rods	4.10	4.10	4.10	3.85
Skelp	3.35	3.35	3.35	3.15

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*

Pig Iron: (per gross ton)	Feb. 6, 1951	Jan. 30, 1951	Jan. 9, 1951	Feb. 7 1950
No. 2 foundry, del'd Phila.	$57.77	$57.77	$57.77	$50.42
No. 2, Valley furnace	52.50	52.50	52.50	46.50
No. 2, Southern Cin'ti	55.58	55.58	55.58	49.08
No. 2, Birmingham	48.88	48.88	48.88	42.38
No. 2, foundry, Chicago†	52.50	52.50	52.50	46.50
Basic del'd Philadelphia	56.92	56.92	56.92	49.92
Basic, Valley furnace	52.00	52.00	52.00	46.00
Malleable, Chicago†	52.50	52.50	52.50	46.50
Malleable, Valley	52.50	52.50	52.50	46.50
Charcoal, Chicago	70.56	70.56	70.56	68.56
Ferromanganese‡	186.25	186.25	181.20	173.40

†The switching charge for delivery to foundries in the Chicago district is $1 per ton.
‡Average of U. S. prices quoted on Ferroalloy page.

Scrap: (per gross ton)				
Heavy melt'g steel, P'gh.	$51.13	$51.13	$46.13	$31.25
Heavy melt'g steel, Phila.	47.50	47.50	44.50	23.00
Heavy melt'g steel, Ch'go	44.63	44.63	44.63	27.50
No. 1 hy. com. sh't, Det.	40.25	40.25	40.25	23.50
Low phos. Young'n	54.50	54.50	48.63	31.75
No. 1 cast, Pittsburgh	67.75	67.75	67.75	37.50
No. 1 cast, Philadelphia	62.50	62.50	62.50	37.00
No. 1 cast, Chicago	63.00	63.00	63.00	38.50
Coke: Connellsville: (per net ton at oven)				
Furnace coke, prompt	$14.25	$14.25	$14.25	$14.00
Foundry coke, prompt	17.25	17.25	17.25	15.75
Nonferrous Metals: (cents per pound to large buyers				
Copper, electro, Conn.	24.50	24.50	24.50	18.50
Copper, Lake, Conn.	24.625	24.625	24.625	18.625
Tin Straits, New York	*$1.825*†	$1.83*	$1.63	74.50
Zinc, East St. Louis	17.50	17.50	17.50	9.75
Lead, St. Louis	16.80	16.80	16.80	11.80
Aluminum, virgin	19.00	19.00	19.00	17.00
Nickel, electrolytic	53.55	53.55	53.55	42.97
Magnesium, ingot	24.50	24.50	24.50	20.50
Antimony, Laredo, Tex.	42.00	42.00	32.00	27.25

†Tentative. *Revised.

Composite Prices

Starting with the issue of May 12, 1949, the weighted finished steel composite was revised for the years 1941 to date. The weights used are based on the average product shipments for the 7 years 1937 to 1940 inclusive and 1946 to 1948 inclusive. The use of quarterly figures has been eliminated because it was too sensitive. (See p. 130 of May 12, 1949, issue.)

	Finished Steel Base Price	Pig Iron	Scrap Steel
Feb. 6, 1951	4.131¢ per lb.	$52.69 per gross ton	$47.75 per gross ton
One week ago	4.131¢ per lb.	52.69 per gross ton	47.75 per gross ton
One month ago	4.131¢ per lb.	52.69 per gross ton	45.09 per gross ton
One year ago	3.837¢ per lb.	46.38 per gross ton	27.25 per gross ton

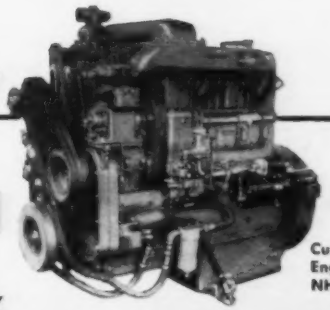
	Finished Steel Base Price High		Finished Steel Base Price Low		Pig Iron High		Pig Iron Low		Scrap Steel High		Scrap Steel Low	
1951	4.131¢	Jan. 2	4.131¢	Jan. 2	$52.69	Jan. 2	$52.69	Jan. 2	$47.75	Jan. 30	$45.09	Jan. 2
1950	4.131¢	Dec. 1	3.837¢	Jan. 3	52.69	Dec. 12	45.88	Jan. 3	45.13	Dec. 19	26.25	Jan. 3
1949	3.837¢	Dec. 27	3.3705¢	May 3	46.87	Jan. 18	45.88	Sept. 6	43.00	Jan. 4	19.33	June 28
1948	3.721¢	July 27	3.193¢	Jan. 1	46.91	Oct. 12	39.58	Jan. 6	43.16	July 27	39.75	Mar. 9
1947	3.193¢	July 29	2.848¢	Jan. 1	37.98	Dec. 30	30.14	Jan. 7	42.58	Oct. 28	29.50	May 20
1946	2.848¢	Dec. 31	2.464¢	Jan. 1	30.14	Dec. 10	25.37	Jan. 1	31.17	Dec. 24	19.17	Jan. 1
1945	2.464¢	May 29	2.396¢	Jan. 1	25.37	Oct. 23	23.61	Jan. 2	19.17	Jan. 2	18.92	May 22
1944	2.396¢		2.396¢		$23.61		$23.61		19.17	Jan. 11	15.76	Oct. 24
1943	2.396¢		2.396¢		23.61		23.61		$19.17		$19.17	
1942	2.396¢		2.396¢		23.61		23.61		19.17		19.17	
1941	2.396¢		2.396¢		$23.61	Mar. 20	$23.45	Jan. 2	$22.00	Jan. 7	$19.17	Apr. 10
1940	2.30467¢	Jan. 2	2.24107¢	Apr. 16	23.45	Dec. 23	22.61	Jan. 2	21.83	Dec. 30	16.04	Apr. 9
1939	2.35367¢	Jan. 3	2.26689¢	May 16	22.61	Sept. 19	20.61	Sept. 12	22.50	Oct. 3	14.08	May 16
1838	2.58414¢	Jan. 4	2.27207¢	Oct. 18	23.25	June 21	19.61	July 6	15.00	Nov. 22	11.00	June 7
1937	2.58414¢	Mar. 9	2.32263¢	Jan. 4	32.25	Mar. 9	20.25	Feb. 16	21.92	Mar. 30	12.67	June 9
1936	2.32263¢	Dec. 28	2.05200¢	Mar. 10	19.74	Nov. 24	18.73	Aug. 11	17.75	Dec. 21	12.67	June 8
1932	1.89196¢	July 5	1.83910¢	Mar. 1	14.81	Jan. 5	13.56	Dec. 6	8.50	Jan. 12	6.43	July 5
1929	2.31773¢	May 28	2.26498¢	Oct. 29	18.71	May 14	18.21	Dec. 17	17.58	Jan. 29	14.08	Dec. 8

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strips, representing major portion of finished steel shipment. Index recapitulated in Aug. 28, 1941, issue and in May 12, 1949.

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

At Cummins Engine Company



Cummins Diesel Engine — Model NHRBS — 600 — 300 HP

MAGNAFLUX* INSPECTION SAVES $600 — $800 a Week

and

INSURES dependable engine quality!

Magnaflux inspection of injector bodies at CUMMINS ENGINE COMPANY, INC., Columbus, Indiana

Inspecting rough forged connecting rods for Magnaglo fluorescent indications under black light.

Cummins Engine Company Diesels are recognized for dependable service in the field. This they insure in manufacture by fully effective Magnaflux-Magnaglo* inspection of critical parts.

By using Magnaglo to detect defective forgings and castings *in the rough*, Cummins Engine Company eliminates useless finishing operations. Direct savings in machining time, equipment and labor are currently averaging $600 to $800 a week—with production capacity increased in similar ratio.

Forgings and castings to be inspected are hand-loaded onto the Magnaflux unit's endless conveyor and automatically processed with Magnaglo. At the inspection station pertinent defects are indicated under the black light by glowing fluorescent lines. Depending upon the kind of parts in process, up to 1200 pieces per hour can be inspected.

Cummins' operation may not be typical of your problem but Magnaflux has solutions for most industries. Invite an experienced Magnaflux engineer to discuss them with you.

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Export Distributor: Curtis Wright Corp. *In Canada:* Williams & Wilson, Ltd.

IRON AGE

STEEL PRICES

Smaller numbers in price boxes indicate producing companies. For main office locations, see key on facing page.
Base prices at producing points apply only to sizes and grades produced in these areas. Prices are in cents per lb unless otherwise noted. Extras apply.

	Pittsburgh	Chicago	Gary	Cleveland	Canton Massillon	Middletown	Youngstown	Bethlehem	Buffalo	Conshohocken	Johnstown	Sparrows Point	Granite City	Detroit
INGOTS Carbon forging, net ton	$52.00[1]													
Alloy, net ton	$54.00[1,17]													$54.00[11]
BILLETS, BLOOMS, SLABS Carbon, rerolling, net ton	$56.00[1,5]	$56.00[1]	$56.00[1]						$56.00[3]		$56.00[3]			
Carbon forging billets, net ton	$66.00[1,5]	$66.00[1,4]	$66.00[1]	$66.00[4]	$66.00[4]				$66.00[3,4]	$73.00[26]	$66.00[3]			$69.00[11]
Alloy, net ton	$70.00[1,17]	$70.00[1,4]	$70.00[1]		$70.00[4]			$70.00[3]	$70.00[3,4]	$77.00[26]	$70.00[3]			$73.00[11]
PIPE SKELP	3.35[1] 3.45[5]						3.35[1,4]							
WIRE RODS	4.10[2] 4.30[18]	4.10[2,4,33]	4.10[6]	4.10[2]			4.10[6]				4.10[3]	4.20[3]		
SHEETS Hot-rolled (18 ga. & hvr.)	3.60[1,5,9,15] 3.75[26]	3.60[8,23]	3.60[1,6,8]	3.60[4]		3.60[7]	3.60[1,4,6] 4.00[13]		3.60[3]	4.00[26]		3.60[3]		3.80[12] 4.40[17]
Cold-rolled	4.35[1,5,9,15] 5.35[63]		4.35[1,6,8]	4.35[4]		4.35[7]	4.35[4,6]		4.35[3]			4.35[3]		4.55[12]
Galvanized (10 gage)	4.80[1,9,15]		4.80[1,8]		4.80[4]	4.80[7]	6.00[64]					4.80[3]		
Enameling (12 gage)	4.65[1]		4.65[1,8]			4.65[7]								
Long terne (10 gage)	5.20[9,15]						6.00[64]							
Hi str. low alloy, h.r.	5.40[1,5] 5.75[9]	5.40[1]	5.40[1,8] 5.90[6]	5.40[4]			5.40[1,4,13]		5.40[3]	5.65[26]		5.40[3]		
Hi str. low alloy, c.r.	6.55[1,5] 6.90[9]		6.55[1,8] 7.05[6]	6.55[4]			6.55[4]		6.55[2]			6.55[2]		
Hi str. low alloy, galv.	7.20[1]													
STRIP Hot-rolled	3.60[9], 4.00[41,58], 3.75[26] 3.50[5]	3.50[66]	3.50[1,6,8]			3.50[7]	3.50[1,4,6] 4.00[13]		3.50[3,4]	3.90[26]		3.50[3]		4.40[17]
Cold-rolled	4.65[5,9] 5.00[28] 5.35[63,58]	4.90[8,66]	4.90[8]	4.65[2]		4.65[7]	4.65[4,6] 5.35[13,40]		4.65[3]			4.65[3]		5.45[17] 5.60[28] 5.60[31]
Hi str. low alloy, h.r.	5.75[9]		5.50[1] 5.30[8], 5.80[6]				4.95[4], 5.50[1] 5.40[13]			5.55[26]				
Hi str. low alloy, c.r.	7.20[9]			6.70[5]			6.20[4], 6.55[13]							
TINPLATE† Cokes, 1.25-lb base box 1.50 lb add 25¢	$8.70[1,5,9,15]		$8.70[1,6,8]				$8.70[4]					$8.80[3]		
Electrolytic 0.25, 0.50, 0.75 lb box	0.25 lb. base box, $7.15[1,4,5,8,9]; $7.25[3,11]; $7.35[22] 0.50 lb., add 2½¢; 0.75 lb. add 65¢													
BLACKPLATE, 29 gage Hollowware enameling	5.85[1] 6.15[15]		5.85[1]				5.30[4]							
BARS Carbon steel	3.70[1,5] 3.85[9]	3.70[1,4,23]	3.70[1,4,6,8]	3.70[1]	3.70[4]		3.70[1,4,6]		3.70[3,4]		3.70[3]			3.85[21]
Reinforcing‡	3.70[1,5]	3.70[4]	3.70[1,6,8]	3.70[1]			3.70[1,4]		3.70[3,4]		3.70[3]	3.70[3]		
Cold-finished	4.55[2,4,5,52,71]	4.55[2,69,70,23,73]	4.55[2,4,73]	4.55[2]	4.55[4,52]									4.70[64]
Alloy, hot-rolled	4.30[1,17]	4.30[1,4,23]	4.30[1,6,8]		4.30[4]		4.30[1,6]	4.30[3]	4.30[3,4]		4.30[3]			4.45[21]
Alloy, cold-drawn	5.40[17,52,69,71]	5.40[4,23,69,70,73]	5.40[4] 5.90[74]		5.40[4,52]			5.40[3]	5.40[3]					5.55[64]
Hi str. low alloy, h.r.	5.55[1,5]		5.55[1,8] 6.05[6]	5.55[4]			5.55[1]	5.55[3]	5.55[3]		5.55[3]			
PLATE Carbon steel	3.70[1,5,15]	3.70[1]	3.70[1,6,8]	3.70[4] 4.00[9]			3.70[1,4] 3.95[13]		3.70[3]	4.15[26]	3.70[3]	3.70[3]		
Floor plates			4.75[8]	4.75[5]						4.75[26]				
Alloy	4.75[1]	4.75[1]	4.75[1]				5.20[13]			5.05[26]	4.75[3]	4.75[3]		
Hi str. low alloy	5.65[1,5]	5.65[1]	5.65[1,8]	5.65[4,5]			5.65[4] 5.70[13]			5.90[26]	5.65[3]	5.65[3]		
SHAPES, Structural	3.65[1,5] 3.90[9]	3.65[1,23]	3.65[1,8]					3.70[3]	3.70[3]		3.70[3]			
Hi str. low alloy	5.60[1,5]	5.50[1]	5.50[1,8]					5.50[3]	5.50[3]		5.50[3]			
MANUFACTURERS' WIRE Bright	4.85[2,5] 5.10[18]	4.85[2] 4.35		4.65[2]				Kokomo—5.80[30]			4.85[3]	4.95[3]	Duluth—4.85[2]	
PILING, Steel Sheet	4.45[1]	4.45[1]	4.45[8]						4.45[3]					

Smaller numbers indicate producing companies. See key at right. Prices are in cents per lb unless otherwise noted. Extras apply.

IRON AGE

STEEL PRICES

Kansas City	Houston	Birmingham	WEST COAST Seattle, San Francisco, Los Angeles, Fontana		
			F=$79.00[19]		INGOTS Carbon forging, net ton
	$62.00[83]		F=$80.00[19]		Alloy, net ton
		$56.00[11]	F=$75.00[19]		BILLETS, BLOOMS, SLABS Carbon, rerolling, net ton
	$74.00[83]	$66.00[11]	F=$85.00[19] SF, LA, S=$85.00[62]		Carbon forging billets, net ton
	$78.00[83]		F=$83.00[19] LA=$90.00[62]		Alloy net ton
					PIPE SKELP
	4.50[83]	4.10[4,11]	SF=4.90[2] LA=4.90[24,62]	Worcester=4.40[2] Minnequa=4.35[14]	WIRE RODS
		3.60[4,11]	SF, LA=4.30[24] F=4.55[19]	Niles=5.25[64], Geneva=3.70[16]	SHEETS Hot-rolled (18 ga. & hvr.)
		4.35[11]	SF=5.30[24] F=5.30[19]		Cold-rolled
		4.80[4,11]	SF, LA=5.55[24]	Ashland=4.80[7]	Galvanized (10 gage)
					Enameling (12 gage)
					Long ternes (10 gage)
		5.40[11]	F=6.35[19]		Hi str. low alloy, h.r.
			F=7.50[19]		Hi str. low alloy, c.r.
					Hi str. low alloy, galv.
4.10[83]	4.90[83]	3.50[4]	SF, LA=4.25[24,62] F=4.75[19], S=4.50[62]	Atlanta=4.05[65] Minnequa=4.55[14]	STRIP Hot-rolled
			F=6.30[19] LA=6.40[27]	New Haven=5.15[2], 5.85[68]	Cold-rolled
		5.30[11]	F=6.20[19]		Hi str. low alloy, h.r.
					Hi str. low alloy, c.r.
		$8.55	SF=$9.20		TINPLATE Cokes, 1.25-lb base box 1.50 lb, add 25¢
					Electrolytic 0.25, 0.50, 0.75 lb box
					BLACKPLATE, 29 gage Hollowware enameling
4.30[83]	4.10[83]	3.70[4,11]	SF, LA=4.40[24]	Atlanta=4.25[65] Minnequa=4.15[14]	BARS Carbon steel
4.30[83]	4.10[83]	3.70[4,11]	SF, S=4.45[62] F=4.40[19], LA=4.40[62]	Atlanta=4.25[65] Minnequa=4.50[14]	Reinforcing‡
				Newark=5.00[69] Putnam=5.10[69] Hartford=5.10[4] Los Angeles=6.00[4]	Cold-finished
4.90[83]	4.70[83]		LA=5.35[62] F=5.35[19]		Alloy, hot-rolled
				Newark=5.75[69] Worcester=[2] Hartford=5.85[4]	Alloy, cold-drawn
		5.55[11]	F=6.60[19]		Hi str. low alloy, h.r.
	4.10[83]	3.70[4,11]	F=4.30[19] S=4.60[62] Geneva=3.70[16]	Claymont=4.15[29] Coatesville=4.15[21] Minnequa=4.50[14]	PLATE Carbon steel
				Harrisburg=5.25[35]	Floor plates
			F=5.70[19] Geneva=5.65[16]	Coatesville=5.25[21] Claymont=4.85[29]	Alloy
		5.85[11]	F=6.25[19]		Hi str. low alloy
4.25[83]	4.05[83]	3.65[4,11]	SF=4.20[62] F=4.25[16] LA=4.25[24,62] S=4.30[62]	Geneva 3.85[16] Minnequa 4.10[14]	SHAPES, Structural
		50[11]	F=6.10[19]		Hi str. low alloy
5.45[83]	5.25[83]	4.65[4,11]	SF, LA=5.80[24]	Atlanta=5.10[65] Worcester=5.15[2] Minnequa=5.10[14]	MANUFACTURERS' WIRE Bright

KEY TO STEEL PRODUCERS

1 U. S. Steel Co., Pittsburgh
2 American Steel & Wire Co., Cleveland
3 Bethlehem Steel Co., Bethlehem
4 Republic Steel Corp., Cleveland
5 Jones & Laughlin Steel Corp., Pittsburgh
6 Youngstown Sheet & Tube Co., Youngstown
7 Arco Steel Corp., Middletown, Ohio
8 Inland Steel Co., Chicago
9 Weirton Steel Co., Weirton, W. Va.
10 National Tube Co., Pittsburgh
11 Tennessee Coal, Iron & R. R. Co., Birmingham
12 Great Lakes Steel Corp., Detroit
13 Sharon Steel Corp., Sharon, Pa.
14 Colorado Fuel & Iron Corp., Denver
15 Wheeling Steel Corp., Wheeling, W. Va.
16 Geneva Steel Co., Salt Lake City
17 Crucible Steel Co. of America, New York
18 Pittsburgh Steel Co., Pittsburgh
19 Kaiser Steel Corp., Oakland, Calif.
20 Portsmouth Div., Detroit Steel Corp., Detroit
21 Lukens Steel Co., Coatesville, Pa.
22 Granite City Steel Co., Granite City, Ill.
23 Wisconsin Steel Co., South Chicago, Ill.
24 Columbia Steel Co., San Francisco
25 Copperweld Steel Co., Glassport, Pa.
26 Alan Wood Steel Co., Conshohocken, Pa.
27 Calif. Cold Rolled Steel Corp., Los Angeles
28 Allegheny Ludlum Steel Corp., Pittsburgh
29 Worth Steel Co., Claymont, Del.
30 Continental Steel Corp., Kokomo, Ind.
31 Rotary Electric Steel Co., Detroit
32 Laclede Steel Co., St. Louis
33 Northwestern Steel & Wire Co., Sterling, Ill.
34 Keystone Steel & Wire Co., Peoria, Ill.
35 Central Steel & Wire Co., Harrisburg, Pa.
36 Carpenter Steel Co., Reading, Pa.
37 Eastern Stainless Steel Corp., Baltimore
38 Washington Steel Corp., Washington, Pa.
39 Jessop Steel Co., Washington, Pa.
40 Blair Strip Steel Co., New Castle, Pa.
41 Superior Steel Corp., Carnegie, Pa.
42 Timken Steel & Tube Div., Canton, Ohio
43 Babcock & Wilcox Tube Co., Beaver Falls, Pa.
44 Reeves Steel & Mfg. Co., Dover, Ohio
45 John A. Roebling's Sons Co., Trenton, N. J.
46 Simonds Saw & Steel Co., Fitchburg, Mass.
47 McLouth Steel Corp., Detroit
48 Cold Metal Products Co., Youngstown
49 Thomas Steel Co., Warren, Ohio
50 Wilson Steel & Wire Co., Chicago
51 Sweet's Steel Co., Williamsport, Pa.
52 Superior Drawn Steel Co., Monaca, Pa.
53 Tremont Nail Co., Wareham, Mass.
54 Firth Sterling St. & Carbide Corp., McKeesport
55 Ingersoll Steel Div., Chicago
56 Phoenix Iron & Steel Co., Phoenixville, Pa.
57 Fitzsimmons Steel Co., Youngstown
58 Stanley Works, New Britain, Conn.
59 Universal-Cyclops Steel Corp., Bridgeville, Pa.
60 American Cladmetals Co., Carnegie, Pa.
61 Cuyahoga Steel & Wire Co., Cleveland
62 Bethlehem Pacific Coast Steel Corp., San Fran.
63 Follansbee Steel Corp., Pittsburgh
64 Niles Rolling Mill Co., Niles, Ohio
65 Atlantic Steel Co., Atlanta
66 Acme Steel Co., Chicago
67 Joslyn Mfg. & Supply Co., Chicago
68 Detroit Steel Corp., Detroit
69 Wycoff Steel Co., Pittsburgh
70 Bliss & Laughlin, Inc., Harvey, Ill.
71 Columbia Steel & Shafting Co., Pittsburgh
72 Cumberland Steel Co., Cumberland, Md.
73 La Salle Steel Co., Chicago
74 Monarch Steel Co., Inc., Hammond, Ind.
75 Empire Steel Co., Mansfield, Ohio
76 Mahoning Valley Steel Co., Niles, Ohio
77 Oliver Iron & Steel Co., Pittsburgh
78 Pittsburgh Screw & Bolt Co., Pittsburgh
79 Standard Forging Corp., Chicago
80 Driver Harris Co., Harrison, N. J.
81 Detroit Tube & Steel Div., Detroit
82 Reliance Div., Eaton Mfg. Co., Massillon, Ohio
83 Sheffield Steel Corp., Kansas City
84 Plymouth Steel Co., Detroit
85 Wickwire Spencer Steel, Buffalo
86 Angell Nail and Chaplet, Cleveland
87 Mid-States Steel & Wire, Crawfordsville, Ind.
88 National Supply, Pittsburgh, Pa.
89 Wheatland Tube Co., Wheatland, Pa.
90 Mercer Tube & Mfg. Co., Sharon, Pa.
91 Woodward Iron Co., Woodward, Ala.
92 Sloss-Sheffield Steel & Iron Co., Birmingham
93 Hanna Furance Corp., Detroit
94 Interlake Iron Corp., Cleveland
95 Lone Star Steel Co., Dallas
96 Mystic Iron Works, Everett, Mass.
97 Jackson Iron & Steel Co., Jackson, O.
98 Globe Iron Co., Jackson, O.
99 Pittsburgh Coke & Chemical Co., Pittsburgh
100 Shenango Furnace Co., Pittsburgh
101 Tennessee Products & Chemical Corp., Nashville
102 Koppers Co., Inc., Granite City, Ill.
103 Page Steel & Wire Div., American Chain & Cable., Monessen, Pa.

STAINLESS STEELS

Base price, cents per lb, f. o. b. mill.

Product	301	302	303	304	316	321	347	410	416	430
Ingots, rerolling	14.25	15.00	16.50	16.00	24.25	19.75	21.50	12.75	14.75	13.00
Slabs, billets rerolling	18.50	19.75	21.75	20.75	31.75	26.00	28.25	16.50	20.00	16.75
Forg. discs, die blocks, rings	34.00	34.00	36.50	35.50	52.50	40.00	44.50	28.00	28.50	28.50
Billets, forging	26.25	26.25	28.25	27.50	41.00	31.00	34.75	21.50	22.00	22.00
Bars, wires, structurals	31.25	31.25	33.75	32.75	48.75	36.75	41.25	25.75	26.25	26.25
Plates	33.00	33.00	35.00	35.00	51.50	40.50	45.00	27.00	27.50	27.50
Sheets	41.00	41.00	43.00	43.00	56.50	49.00	53.50	36.50	37.00	39.00
Strip, hot-rolled	26.50	28.00	32.25	30.00	48.25	36.75	41.00	23.50	30.25	24.00
Strip, cold-rolled	34.00	36.50	40.00	38.50	58.50	48.00	52.00	30.50	37.00	31.00

STAINLESS STEEL PRODUCING POINTS—*Sheets:* Midland, Pa., 17; Brackenridge, Pa., 28; Butler, Pa., 7; McKeesport, Pa., 1; Washington, Pa., 38 (type 316 add 5¢), 39; Baltimore, 37; Middletown, Ohio, 7; Massillon, Ohio, 4; Gary, 1; Bridgeville, Pa., 59; New Castle, Ind., 55; Ft. Wayne, Ind., 67; Lockport, N. Y., 46.

Strip: Midland, Pa., 17; Cleveland, 2; Carnegie, Pa., 41; McKeesport, Pa., 54; Reading, Pa., 36; Washington, Pa., 38 (type 316 add 5¢); W. Leechburg, Pa., 28; Bridgeville, Pa., 59; Detroit, 47; Massillon, Canton, Ohio, 4; Middletown, Ohio, 7; Harrison, N. J., 80; Youngstown, 48; Lockport N. Y., 46; New Britain, Conn., 58; Sharon, Pa., 13; Butler, Pa., 7.

Bars: Baltimore, 7; Duquesne, Pa., 1; Munhall, Pa., 1; Reading, Pa., 36; Titusville, Pa., 59; Washington, Pa., 39; McKeesport, Pa., 1, 54; Bridgeville, Pa., 59; Dunkirk, N. Y., 28; Massillon, Ohio, 4; Chicago, 1; Syracuse, N. Y., 17; Watervliet, N. Y., 28; Waukegan, Ill., 2; Lockport, N. Y. 46; Canton, Ohio, 42; Ft. Wayne, Ind., 67.

Wire: Waukegan, Ill., 2; Massillon, Ohio, 4; McKeesport, Pa., 54; Bridgeport, Conn., 44; Ft. Wayne, Ind., 67; Trenton, N. J., 45; Harrison, N. J., 80; Baltimore, 7; Dunkirk, 28; Monessen, 103.

Structurals: Baltimore, 7; Massillon, Ohio, 4; Chicago, 1, 67; Watervliet, N. Y., 28; Bridgeport, Conn., 44.

Plates: Brackenridge, Pa., 28 (type 416 add ½¢); Butler, Pa., 7; Chicago, 1; Munhall, Pa., 1; Midland, Pa., 17; New Castle, Ind., 55; Lockport, N. Y., 46; Middletown, 7; Washington, Pa., 39; Cleveland, Massillon, 4.

Forged discs, die blocks, rings: Pittsburgh, 1, 17; Syracuse, 17; Ferndale, Mich., 28.

Forging billets: Midland, Pa., 17; Baltimore, 7; Washington, Pa., 39; McKeesport, 54; Massillon, Canton, Ohio, 4; Watervliet, 28; Pittsburgh, Chicago, 1.

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard & Coated Nails Base Col.	Woven Wire Fence 9-15½ ga. Base Col.	Fence Posts Base Col.	Single Loop Bale Ties Base Col.	Twisted Barbless Wire Base Col.	Gal. Barbed Wire Base Col.	Merch. Wire Ann'ld. ¢/lb.	Merch. Wire Gal. (1) ¢/lb.
Alabama City-4	118	126	....	123	....	136	5.70	5.95
Aliquippa, Pa.-5	118	132	....	....	136	140	5.70	6.15
Atlanta-65	121	133	....	126	126	143	5.95	6.40
Bartonville-34	118	130	140	123	143	143	5.95	6.15
Buffalo-85	....	....	....	....	....	....	4.85	....
Cleveland-86	125	....	....	....	....	....	....	....
Cleveland-2	....	....	....	....	....	....	5.70	6.15
Crawfordsville-87	....	132	....	....	....	145	5.95	6.40
Donora, Pa.-2	118	130	....	123	....	140	5.70	6.15
Duluth-2	118	130	....	123	....	140	5.70	6.15
Fairfield, Ala.-11	118	130	....	123	....	136	5.70	6.15
Houston-83	126	138	....	....	....	148	6.10	6.55
Johnstown, Pa.-3	118	130	....	....	140	....	5.70	6.15
Joliet, Ill.-2	118	130	....	123	....	140	5.70	6.15
Kokomo, Ind.-30	120	132	....	125	138	138	5.80	6.05
Los Angeles-62	....	....	....	....	....	....	6.65	....
Kansas City-83	130	130	142	135	....	152	6.30	6.75
Minnequa-14	123	138	130	128	146	146	5.95	6.45
Monessen-18	124	135	....	....	....	145	5.95	6.40
Moline, Ill.-4	....	....	136	....	....	....	....	....
Palmer-85	....	....	....	....	....	....	....	....
Pittsburg, Cal.-24	137	149	....	147	156	160	6.65	6.80
Portsmouth-20	124	137	....	....	147	147	6.10	6.60
Rankin, Pa.-2	118	130	....	....	....	140	5.70	6.15
So. Chicago, Ill.-4	118	126	140	123	....	136	5.70	5.95
S. San Fran.-14	....	....	....	147	....	160	6.65	7.10
Sparrows Pt.-3	120	....	....	125	142	142	5.80	6.25
Sterling, Ill.-33	118	130	140	123	140	140	5.70	6.15
Struthers, Ohio-6	....	....	....	....	....	....	5.70	6.15
Torrance, Cal.-24	138	....	....	....	....	....	6.65	....
Worcester-2	124	....	....	....	....	....	6.00	6.45
Williamsport, Pa.-51	....	....	150	....	....	....	....	....

Cut Nails, carloads, base, $6.75 per 100 lb. (less 20¢ to jobbers) at Conshohocken, Pa., (26), Wareham, Mass. (53), Wheeling, W. Va., (15).

(1) Alabama City and So. Chicago do not include zinc extra.

CAST IRON WATER PIPE

Per Net Ton

6 to 24-in., del'd Chicago. $105.30 to $108.80
6 to 24-in., del'd N. Y. . . 108.50 to 109.50
6 to 24-in., Birmingham. 91.50 to 96.00
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles, for all rail shipment; rail and water shipment less ..... $108.50 to $113.00
Class "A" and gas pipe, $5 extra; 4-in. pipe is $5 a ton above 6-in.

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Axles	Screw Spikes	Tie Plates	Track Bolts Untreated
Bessemer-1	3.60	4.00	4.70	....	....	....	....	....
Chicago-4	....	....	....	6.15	....	....	....	....
Ensley-11	3.60	4.00	....	....	....	....	....	....
Fairfield-11	....	4.00	4.40	....	....	8.60	4.50	....
Gary-1	3.60	4.00	....	....	....	....	4.50	....
Ind. Harbor-8	3.60	....	4.70	6.15	5.25	8.60	4.50	....
Johnstown-3	....	4.00	....	....	5.60	8.60	....	....
Joliet-1	....	4.00	4.70	....	....	....	....	....
Kansas City-83	....	....	....	6.40	....	....	....	....
Lackawanna-3	3.60	4.00	4.70	....	....	8.60	4.50	....
Lebanon-3	....	....	....	6.15	....	....	....	9.85
Minnequa-14	3.60	4.50	4.70	6.15	....	8.60	4.50	9.85
Pittsburgh-77	....	....	....	....	....	9.35	....	9.85
Pittsburgh-78	....	....	....	....	....	....	....	9.85
Pittsburgh-5	....	....	....	6.15	....	....	....	....
Pittsburg-24	....	....	....	....	....	....	4.65	....
Seattle-62	....	....	....	6.10	....	....	4.35	....
Steelton-3	3.60	....	4.70	....	....	....	4.50	....
Struthers-6	....	....	....	6.15	....	....	....	....
Torrance-24	....	....	....	....	....	....	4.65	....
Youngstown-4	....	....	....	6.15	....	....	....	....

Track Bolts, heat treated, to railroads, 9.85¢ per lb.

BOILER TUBES

Seamless steel, electric welded commercial boiler tubes, locomotive tubes, minimum wall, per 100 ft at mill, c.l. lots, cut lengths 10 to 24 ft.

OD in in.	gage BWG	Seamless H.R.	Seamless C.D.	Electric Weld H.R.	Electric Weld C.D.
2	13	$22.67	$26.66	$21.99	$25.86
2½	12	30.48	35.84	29.57	34.76
3	12	33.90	39.90	32.89	34.80
3½	11	42.37	49.89	41.10	48.39
4	10	52.60	61.88	51.03	60.02

Pittsburgh Steel add, H-R: 2 in., 62¢; 2½ in., 84¢; 3 in., 92¢; 3½ in., $1.17; 4 in., $1.45. Add, C-R: 2 in., 74¢; 2½ in., 99¢; 3 in., $1.10; 3½ in., $1.37; 4 in., $1.70.

FLUORSPAR

Washed gravel fluorspar, f.o.b. cars, Rosiclare, Ill. Base price, per ton net: Effective CaF, content:

70% or more $43.00
60% or less 40.00

PIPE AND TUBING

Base discounts, f.o.b. mills. Base price about $200 per net ton.

	BUTTWELD ½ In. Blk.	½ In. Gal.	¾ In. Blk.	¾ In. Gal.	1 In. Blk.	1 In. Gal.	1¼ In. Blk.	1¼ In. Gal.	1½ In. Blk.	1½ In. Gal.	2 In. Blk.	2 In. Gal.	2½-3 In. Blk.	2½-3 In. Gal.	SEAMLESS 2 In. Blk.	2 In. Gal.	2½-3 In. Blk.	2½-3 In. Gal.	3½-4 In. Blk.	3½-4 In. Gal.
STANDARD T. & C.																				
Sparrows Pt.-3	34.0	12.0	37.0	16.0	39.5	19.5	40.0	20.0	40.5	21.0	41.0	21.5	41.5	22.0	....	....	....	....	....	....
Cleveland-4	36.0	14.0	39.0	18.0	41.5	21.5	42.0	22.0	42.5	23.0	43.0	23.5	43.5	24.0	....	....	....	....	....	....
Oakland-19	25.0	3.0	28.0	7.0	30.5	10.5	31.0	21.0	31.5	22.0	32.0	12.5	32.5	13.0	....	....	....	....	....	....
Pittsburgh-5	36.0	14.0	39.0	17.0	41.5	19.5	42.0	20.5	42.5	21.0	43.0	21.5	43.5	22.5	29.5	8.0	32.5	11.5	34.5	13.5
Pittsburgh-10	36.0	14.0	39.0	18.0	41.5	21.5	42.0	22.0	42.5	23.0	43.0	23.5	43.5	24.0	29.5	9.5	32.5	12.5	34.5	14.5
St. Louis-32	35.0	13.0	38.0	17.0	40.5	20.5	41.0	21.0	41.5	22.0	42.0	22.5	42.5	23.0	....	....	....	....	....	....
Sharon-90	36.0	13.0	39.0	17.0	41.5	20.0	42.0	20.5	42.5	21.0	43.0	21.5	43.5	22.0	....	....	....	....	....	....
Toledo-88	36.0	14.0	39.0	18.0	41.5	21.5	42.0	22.0	42.5	23.0	43.0	23.5	43.5	24.0	29.5	....	32.5	....	34.5	....
Wheeling-15	36.0	14.0	39.0	18.0	41.5	21.5	42.0	22.0	42.5	23.0	43.0	23.5	43.5	24.0	....	....	....	....	....	....
Wheatland-89	36.0	14.0	39.0	17.0	41.5	19.5	42.0	20.5	42.5	21.0	43.0	21.5	43.5	22.5	....	....	....	....	....	....
Youngstown-6	36.0	14.0	39.0	18.0	41.5	21.5	42.0	22.0	42.5	23.0	43.0	23.5	43.5	24.0	29.5	9.5	32.5	12.5	34.5	14.5
EXTRA STRONG, PLAIN ENDS																				
Sparrows Pt.-3	33.5	13.0	37.5	17.0	39.5	20.5	40.0	21.0	40.5	22.0	41.0	22.5	41.5	23.0	....	....	....	....	....	....
Cleveland-4	35.5	15.0	39.5	19.0	41.5	22.5	42.0	23.0	42.5	24.0	43.0	24.5	43.5	25.0	....	....	....	....	....	....
Oakland-19	24.5	4.0	28.5	18.0	30.5	11.5	31.0	12.0	31.5	13.0	32.0	13.5	32.5	14.0	....	....	....	....	....	....
Pittsburgh-5	35.5	13.5	39.5	17.5	41.5	19.5	42.0	20.5	42.5	21.0	43.0	21.5	43.5	22.5	29.0	7.5	33.0	12.0	36.0	15.5
Pittsburgh-10	35.5	15.0	39.5	19.0	41.5	22.5	42.0	23.0	42.5	24.0	43.0	24.5	43.5	25.0	29.0	10.0	33.0	14.0	36.5	17.5
St. Louis-32	34.5	14.0	38.5	18.0	40.5	21.5	41.0	22.0	41.5	23.0	42.0	23.5	42.5	24.0	....	....	....	....	....	....
Sharon-90	35.5	14.0	39.5	18.0	41.5	21.0	42.0	21.5	42.5	22.0	43.0	22.5	43.5	23.0	....	....	....	....	....	....
Toledo-88	35.5	15.0	39.5	19.0	41.5	22.5	42.0	23.0	42.5	24.0	43.0	24.5	43.5	25.0	29.0	....	33.0	....	36.5	....
Wheeling-15	35.5	15.0	39.5	19.0	41.5	22.5	42.0	23.0	42.5	24.0	43.0	24.5	43.5	25.0	....	....	....	....	....	....
Wheatland-89	35.5	13.5	39.5	17.5	41.5	19.5	42.0	20.5	42.5	21.0	43.0	21.5	43.5	22.5	....	....	....	....	....	....
Youngstown-6	35.5	15.0	39.5	19.0	41.5	22.5	42.0	23.0	42.5	24.0	43.0	24.5	43.5	25.0	29.0	10.0	33.0	14.0	36.5	17.5

Galvanized discounts based on zinc at 17¢ per lb, East St. Louis. For each 1¢ change in zinc, discounts vary as follows: ½ in., ¾ in., and 1 in., 1 pt.; 1¼ in., 1½ in., 2 in., ¾ pt.; 2½ in., 3 in., ½ pt. Calculate discounts on even cents per lb of zinc, i.e., if zinc is 16.51¢ to 17.50¢ per lb, use 17¢. Jones & Laughlin discounts apply only when zinc price changes 1¢.

Threads only, buttweld and seamless, 1 pt. higher discount. Plain ends, buttweld and seamless, 3 in. and under, 3½ pts. higher discount. Buttweld jobbers' discount, 5 pct.

WAREHOUSES

Base price, f.o.b., dollars per 100 lb. *(Metropolitan area delivery, add 20¢ except Birmingham, San Francisco, Cincinnati, New Orleans, St. Paul, add 15¢; Memphis, add 10¢; Philadelphia, add 25¢; New York, add 30¢).

Cities	Sheets			Strip		Plates	Shapes	Bars		Alloy Bars			
	Hot-Rolled	Cold-Rolled (15 gage)	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled		Standard Structural	Hot-Rolled	Cold-Finished	Hot-Rolled A 4615 As rolled	Hot-Rolled A 4140 Annealed	Cold-Drawn A 4615 As rolled	Cold-Drawn A 4140 Annealed
Baltimore	5.60	6.84	7.49[2]–8.07	6.04	.....	5.80	6.14	6.04	6.84–6.89	10.24	10.54	11.89	12.19
Birmingham*	5.60	6.40	6.75	5.55	.....	5.95	5.70	5.55	.....	.....	.....	.....	.....
Boston	6.20	7.00–7.25	7.74–8.29	6.15	8.50[4]	6.48–6.78	6.20	6.05	6.79–6.84	10.25	10.55	11.90–12.00	12.20–12.30
Buffalo	5.60	6.40	7.74–8.09	5.86	.....	6.05	5.80	5.60	6.40–6.45	10.15–10.85	10.45	11.30	11.95–12.1½
Chicago	5.60	6.40	7.75	5.55	.....	5.80	5.70	5.55	6.30	9.80	10.10	11.45	11.75
Cincinnati*	5.87	6.44	7.39	5.80	.....	6.19	6.09	5.80	6.61	10.15	10.45	11.80	12.10
Cleveland	5.60	6.40	8.10	5.69	6.90	5.92	5.82	5.57	6.40	9.91	10.21	11.56	11.86
Detroit	5.78	6.53	7.89	5.94	.....	5.99	6.09	5.84	6.	10.11	10.41	11.76	12.06
Houston	7.00	8.25	.....	.....	.....	6.85	6.50	6.65	9.35	10.35	11.25	.....	12.75
Indianapolis, del'd	6.00	6.80	8.15	5.95	.....	6.20	6.10	5.95	6.80	.....	.....	.....	.....
Kansas City	6.00	6.80	7.45	6.15	7.50	6.40	6.30	6.15	7.00	10.40	10.70	12.05	12.35
Los Angeles	6.35	7.90	8.85	6.40	9.45[4]	6.40	6.35	6.35	8.20	11.30	11.30	13.20	13.50
Memphis*	6.33–6.38	7.06–7.18	.....	6.33–6.36	.....	6.43–8.02	6.33–6.48	6.06–6.33	7.16–7.32	.....	.....	.....	.....
Milwaukee	5.74	6.54	7.89	5.69–6.59	.....	5.94	5.84	5.69	6.44–6.54	9.94	10.24	11.59	11.89
New Orleans*	5.70	6.59	.....	5.75	7.25	5.95	5.75	5.75	7.30	.....	.....	.....	.....
New York*	5.67–5.97	7.19[5]–7.24[1]	8.14[2]	6.29–6.89	8.63[4]	6.28–6.58	6.10	6.12	6.99	10.05–10.15	10.35–10.45	11.70–11.80	12.10–12.20
Norfolk	6.50[3]	.....	.....	.....	.....	6.50[3]	6.60[3]	6.55[3]	.....	.....	.....	.....	.....
Philadelphia*	5.90	6.80	8.00	6.10	.....	6.05	5.90	6.05	6.86	9.90	10.20	.....	.....
Pittsburgh	5.60	6.40	7.75	5.65–5.95	.....	5.75	5.70	5.55	6.15	9.80	10.10	11.45	11.75
Portland	6.60–7.55	8.95	8.50–9.10	7.30	.....	6.80	6.95	6.90	.....	.....	12.15	.....	.....
Salt Lake City	7.95	.....	9.70–10.50[3]	8.70–8.75	.....	8.05	8.75–8.30	7.95–8.65	9.00	.....	.....	.....	.....
San Francisco*	6.65	8.05[2]	8.55–8.90[2]	6.60	9.45[4]	6.50	6.45	6.45	8.20	11.30	11.30	13.20	13.20–13.50
Seattle	7.05	8.60	9.20	9.05	.....	6.75	6.65	6.75	9.05	.....	.....	.....	.....
St. Louis	5.80–5.85	6.65	8.00	5.80	8.00[4]–8.28	6.13	6.03	5.80	6.55–6.65	10.05	10.35	11.70	12.00
St. Paul*	6.16	6.96	8.31	6.11	.....	6.36	6.26	6.11	6.96	10.36	10.66	12.01	12.31

BASE QUANTITIES (Standard unless otherwise keyed): Cold finished bars; 2000 lb or over. Alloy bars; 1000 to 1999 lb. All others; 2000 to 9999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may not be combined with each other or with galvanized sheets for quantity.

EXCEPTIONS: (1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 400 to 1999 lb; (4) 6000 lb and over; (5) 1500 to 9999 lb.; .8, 2000 to 5999 lb.

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.	Blast Furnace Silvery	Low Phos. Charcoal
Bethlehem-3	54.00	54.50	55.00	55.50	.....	.....	.....
Birmingham-4	48.38	48.88	.....	.....	.....	.....	.....
Birmingham-91	48.38	48.88	.....	.....	.....	.....	.....
Birmingham-92	48.38	48.88	.....	.....	.....	.....	.....
Buffalo-4	52.00	52.50	53.00	.....	.....	.....	.....
Buffalo-93	52.00	52.50	53.00	.....	.....	63.75	.....
Chicago-94	52.00	52.50	52.50	53.00	.....	.....	.....
Cleveland-2	52.00	52.50	52.50	53.00	57.00	.....	.....
Cleveland-4	52.00	52.50	52.50	.....	.....	.....	.....
Daingerfield, Tex.-95	48.00	48.50	48.50	.....	.....	.....	.....
Duluth-94	52.00	52.50	52.50	53.00	.....	.....	.....
Erie-94	52.00	52.50	52.50	53.00	.....	.....	.....
Everett, Mass.-96	.....	53.25	53.75	.....	.....	.....	.....
Fontana-19	58.00	58.50	.....	.....	.....	.....	.....
Geneva, Utah-16	52.00	52.50	52.50	53.00	.....	.....	.....
Granite City, Ill.-102	53.90	54.40	54.90	.....	.....	.....	.....
Hubbard, O.-8	52.00	52.50	52.50	.....	.....	.....	.....
Ironton, Utah-16	52.00	52.50	.....	.....	.....	.....	.....
Jackson, O.-97,98	.....	.....	.....	.....	.....	62.50	.....
Lyle, Tenn.-101	.....	.....	.....	.....	.....	.....	66.00
Menessen-18	54.00	.....	.....	.....	.....	.....	.....
Neville Island-99	52.00	52.50	52.50	53.00	.....	.....	.....
Pittsburgh-1	52.00	.....	.....	53.00	.....	.....	.....
Sharpsville-100	52.00	52.50	52.50	53.00	.....	.....	.....
Steelton-3	54.00	54.50	55.00	55.50	60.00	.....	.....
Swedeland-28	56.00	56.50	57.00	57.50	.....	.....	.....
Toledo-94	52.00	52.50	52.50	53.00	.....	.....	.....
Troy, N. Y.-4	54.00	54.50	55.00	.....	60.00	.....	.....
Youngstown-6	52.00	52.50	52.50	53.00	.....	.....	.....

DIFFERENTIALS: Add 50¢ per ton for each 0.25 pct silicon over base (1.75 to 2.25 pct), 50¢ per ton for each 0.50 pct manganese over 1 pct, $2 per ton for 0.5 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel. Subtract 38¢ per ton for phosphorus content over 0.70 pct. Silvery iron: Add $1.50 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 17 pct. $1 per ton for 0.75 pct or more phosphorus, manganese as above. Bessemer ferrosilicon prices are $1 over comparable silvery iron.

REFRACTORIES

Fire Clay Brick — *(F.o.b. works) Carloads, Per 1000*

First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add $5)	$94.60
No. 1 Ohio	88.00
Sec. quality, Pa., Md., Ky., Mo., Ill.	88.00
No. 2 Ohio	79.20
Ground fire clay, net ton, bulk (except Salina, Pa., add $1.50)	13.75

Silica Brick

Mt. Union, Pa., Ensley, Ala.	$94.60
Childs, Pa.	99.00
Hays, Pa.	100.10
Chicago District	104.50
Western Utah and Calif.	111.10
Super Duty, Hays, Pa., Athens, Tex., Chicago	111.10
Silica cement, net ton, bulk, Eastern (except Hays, Pa.)	16.50
Silica cement, net ton, bulk, Hays, Pa.	18.70
Silica cement, net ton, bulk, Ensley, Ala.	17.60
Silica cement, net ton, bulk, Chicago District	17.60
Silica cement, net ton, bulk, Utah and Calif.	24.70

Chrome Brick — *Per Net Ton*

Standard chemically bonded, Balt., Chester	$82.00

Magnesite Brick

Standard, Baltimore	$104.00
Chemically bonded, Baltimore	98.00

Grain Magnesite — *St. ¾-in. grains*

Domestic, f.o.b. Baltimore, in bulk fines removed	$62.70
Domestic, f.o.b. Chewelah, Wash., in bulk	36.30
in sacks	41.80

Dead Burned Dolomite

F.o.b. producing points in Pennsylvania, West Virginia and Ohio, per net ton, bulk Midwest, add 10¢; Missouri Valley, add 20¢	$13.00

COKE

	Net Ton
Furnace, beehive (f.o.b. oven) Connellsville, Pa.	$14.00 to $14.50
Foundry, beehive (f.o.b. oven) Connellsville, Pa.	$17.00 to $17.50
Foundry, oven coke	
Buffalo, del'd	$25.35
Chicago, f.o.b.	21.00
Detroit, f.o.b.	23.00
New England, del'd	24.80
Seaboard, N. J., f.o.b.	22.00
Philadelphia, f.o.b.	22.70
Swedeland, Pa., f.o.b.	22.60
Plainesville, Ohio, f.o.b.	24.00
Erie, Pa., f.o.b.	23.50
Cleveland, del'd	25.72
Cincinnati, del'd	25.06
St. Paul, f.o.b.	21.00
St. Louis, f.o.b.	24.90
Birmingham, del'd	20.79
Neville Island	23.00

LAKE SUPERIOR ORES

(51.50% Fe; natural content, delivered lower lake ports)

	Per gross ton
Old range, bessemer	$8.70
Old range, nonbessemer	8.55
Mesabi, bessemer	8.45
Mesabi, nonbessemer	8.30
High phosphorus	8.30

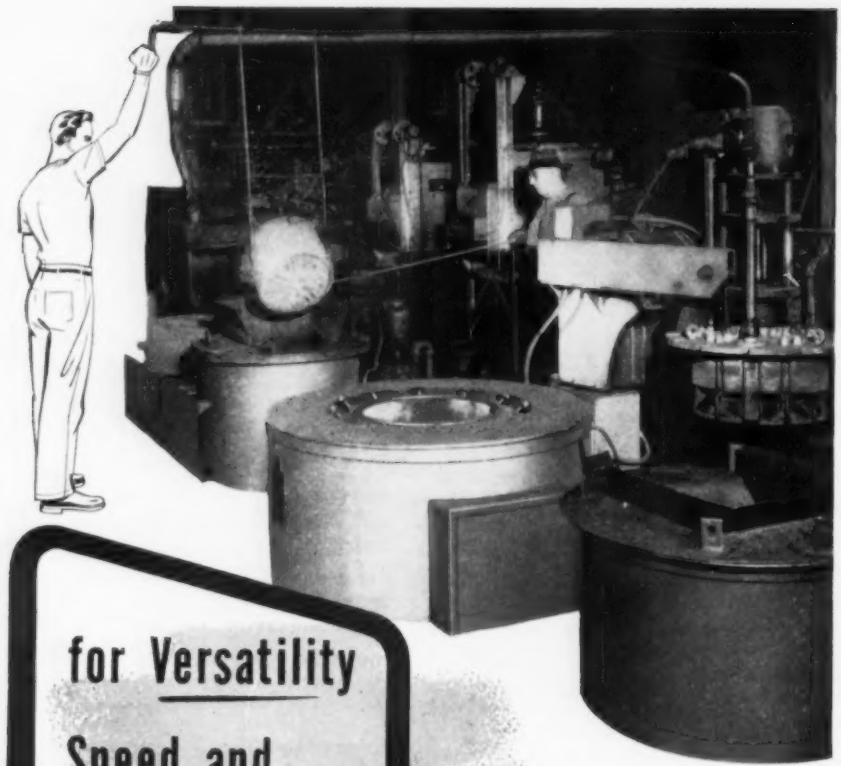
After adjustments for analyses, prices will be increased or decreased as the case may be for increases or decreases after Dec. 2, 1950, in lake vessel rates, upper lake rail freights, dock handling charges and taxes thereon.

C-R SPRING STEEL

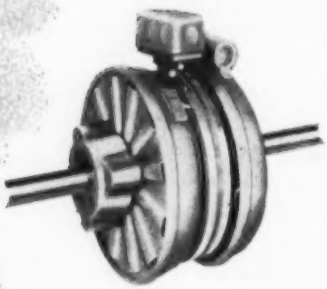
Base per pound f.o.b. mill

0.26 to 0.40 carbon	5.35¢
0.41 to 0.60 carbon	6.80¢
0.61 to 0.80 carbon	7.40¢
0.81 to 1.05 carbon	9.35¢
1.06 to 1.35 carbon	11.65¢

Worcester, add 0.30¢; Sharon, Carnegie, New Castle, add 0.35¢; Detroit, 0.26 to 0.40 carb., add 25¢; other grades add 15¢. New Haven, 0.26 to 0.40 carb., add 50¢; other grades add 5¢.



for Versatility
Speed and
Precision
in their
Heat Treating Department



This combination ICB electric clutch and brake, manufactured by Warner Electric Brake & Clutch Co., has many parts heat treated in Hevi Duty Furnaces.

WARNER ELECTRIC BRAKE & CLUTCH CO.
Relies on
HEVI DUTY FURNACES

Using a Hevi Duty Vertical Retort Furnace, a Hevi Duty Pit Type Convection Furnace, and two Hevi-Duty Multi-Range Box Furnaces, Warner Electric Brake & Clutch Co., finds a highly satisfactory solution for their heat treating requirements.

This versatile installation has provided years of trouble-free service in production processing, and maintenance of tools and dies.

If you have a heat treating problem, ask a Hevi Duty engineer for his suggestions. Write for complete information.

HEVI DUTY ELECTRIC COMPANY
HEAT TREATING FURNACES HEVI-DUTY ELECTRIC EXCLUSIVELY
DRY TYPE TRANSFORMERS — CONSTANT CURRENT REGULATORS
MILWAUKEE 1, WISCONSIN

BOLTS, NUTS, RIVETS, SCREWS

Consumer Prices

(Base discount, f.o.b. mill, Pittsburgh, Cleveland, Birmingham or Chicago)

Machine and Carriage Bolts

	Pct Off List Less Case	C.
½ in. & smaller x 6 in. & shorter	15	28½
9/16 in. & ⅝ in. x 6 in. & shorter	18½	30½
¾ in. & larger x 6 in. & shorter	17½	29½
All diam. longer than 6 in.	14	27½
Lag, all diam. x 6 in. & shorter	23	35
Lag, all diam. longer than 6 in.	21	33
Plow bolts	34	....

Nuts, Hot Pressed, Cold Punched—Sq

	Pct Off List Less Keg (Reg.)	K.	Less Keg (Hvy.)	K.
½ in. & smaller	15	28½	15	28½
9/16 in. & ⅝ in.	12	25	6½	21
¾ in. to 1½ in. inclusive	9	23	1	16½
1⅝ in. & larger	7½	22	1	16½

Nuts, Hot Pressed—Hexagon

½ in. & smaller	26	37	22	34
9/16 in. & ⅝ in.	16½	29½	6½	21
¾ in. to 1½ in. inclusive	12	25	2	17½
1⅝ in. & larger	8½	23	2	17½

Nuts, Cold Punched—Hexagon

½ in. & smaller	26	37	22	34
9/16 in. & ⅝ in.	23	35	17½	30½
¾ in. to 1½ in. inclusive	19½	31½	12	25
1⅝ in. & larger	12	25	6½	21

Nuts, Semi-Finished—Hexagon

	Reg.		Hvy.	
½ in. & smaller	35	45	28½	39½
9/16 in. & ⅝ in.	29½	40½	22	34
¾ in. to 1½ in. inclusive	24	36	15	28½
1⅝ in. & larger	13	26	8½	23
	Light			
7/16 in. & smaller	35	45		
½ in. thru ⅝ in.	28½	39½		
¾ in. to 1½ in. inclusive	26	37		

Stove Bolts — *Pct Off List*

Packaged, steel, plain finished 56—10
Packaged, plated finish..... 41—10
Bulk, plain finish**..... 67*

*Discounts apply to bulk shipments in not less than 15,000 pieces of a size and kind where length is 3-in. and shorter; 5000 pieces for lengths longer than 3-in. For lesser quantities, packaged price applies.

**Zinc, Parkerized, cadmium or nickel plated finishes add 6¢ per lb net. For black oil finish, add 2¢ per lb net.

Rivets — *Base per 100 lb.*

½ in. & larger..... $7.85

Pct Off List

7/16 in. & smaller..... 36

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham, Lebanon, Pa.

Cap and Set Screws

(In bulk)	Pct Off List
Hexagon head cap screws, coarse or fine thread, ¼ in. thru ⅝ in. x 6 in., SAE 1020, bright	54
¾ in. thru 1 in. up to & including 6 in.	48
¼ in. thru ⅝ in. x 6 in. & shorter high C double heat treat	46
¾ in. thru 1 in. up to & including 6 in.	41
Milled studs	35
Flat head cap screws, listed sizes	16
Fillister head cap, listed sizes	34
Set screws, sq head, cup point, 1 in. diam. and smaller x 6 in. & shorter	53

S. M. Ferrochrome

Contract price, cents per pound, chromium contained, lump size, delivered.

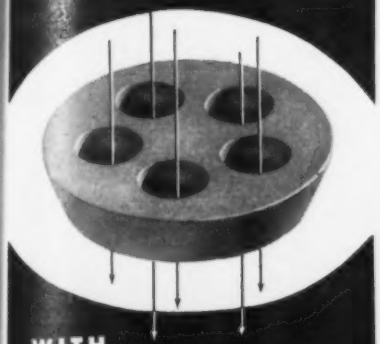
High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

Carloads	21.60
Ton lots	23.75
Less ton lots	25.25

Low carbon type: 62-66% Cr, 4-6% Si, 4-6% Mn, 1.25% max. C.

Carloads	27.75
Ton lots	30.05
Less ton lots	31.85

CLEAN METAL



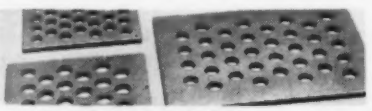
WITH

AlSiMag® Ceramic STRAINER CORES

Your skimmer can't catch all the impurities in the pour off. AlSiMag ceramic strainer cores will help him do it.

ALSIMAG STRAINER CORES are designed to fit snugly into the gate of your mold. As the metal pours through the strainer core it leaves behind many impurities and particles of foreign matter—any one of which might have ruined your casting! AlSiMag cores also regulate the flow of the incoming metal to a smooth, even stream. They are flat, precision made, kiln-fired to stand the heat of molten metal. Test some samples and watch their performance for these qualities:

- Little abrasion from metal stream
- Allow positive even flow of metal
- Even thermal expansion
- Withstand all normal pouring temperatures
- Tough, easy to use on fast production



ALSIMAG CUT-OFF CORES are used in the riser to form a weak joint between riser and casting. This reduces cut-off time, in many cases riser can be knocked off instead of cut off. A great time and money saver.

Cameron Cores Patent Number 2313517 sold to Meehanite Licensees only.

FREE SAMPLES: Test these products in your own foundry. Additional uses, other than those mentioned above, are possible. Samples of AlSiMag materials in stock will be sent free on request. Samples to your own specifications will be supplied at a minimum cost.

AMERICAN LAVA CORPORATION

49TH YEAR OF CERAMIC LEADERSHIP

CHATTANOOGA 5, TENNESSEE

OFFICES: PHILADELPHIA • ST. LOUIS • CAMBRIDGE, MASS. • CHICAGO • LOS ANGELES • NEWARK, N. J.

ELECTRODES

Cents per lb., f.o.b. plant, threaded electrodes with nipples, unboxed

Diam. in in.	Length in in.	Cents Per lb.
	GRAPHITE	
17, 18, 20	60, 72	17.85
8 to 16	48, 60, 72	17.85
7	48, 60	19.57
6	48, 60	20.95
4, 5	40	21.50
3	40	22.61
2½	24, 30	23.15
2	24, 30	25.36
	CARBON	
40	100, 110	8.03
35	65, 110	8.03
30	65, 84, 110	8.03
24	72 to 104	8.03
20	84, 90	8.03
17	60, 72	8.03
14	60, 72	8.57
10, 12	60	8.84
8	60	9.10

CLAD STEEL

Base prices, cents per pound, f.o.b. mill

	Plate	Sheet
Stainless-carbon		
No. 304, 20 pct, Coatesville, Pa. (21)	*29.5	
Washgtn, Pa. (39)	*29.5	
Claymont, Del. (29)	*28.00	
Conshohocken, Pa. (26)		*24.00
New Castle, Ind. (55)	*26.50	*25.50
Nickel-carbon 10 pct Coatesville (21)	32.5	
Inconel-carbon 10 pct Coatesville (21)	40.5	
Monel-carbon 10 pct Coatesville (21)	33.5	
No. 302 Stainless-copper-stainless, Carnegie, Pa. (60)		77.00
Aluminized steel sheets, hot dip, Butler, Pa. (7)		7.75

*Includes annealing and pickling, or sandblasting.

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	Base per lb
18	4	1	—	—	$1.235
18	4	1	—	5	$1.86
18	4	2	—	—	$1.38
1.5	4	1.5	8	—	78.5¢
6	4	2	6	—	.87¢

High-carbon chromium ..... 63.5¢
Oil hardened manganese ..... 35¢
Special carbon ..... 32.5¢
Extra carbon ..... 27¢
Regular carbon ..... 23¢

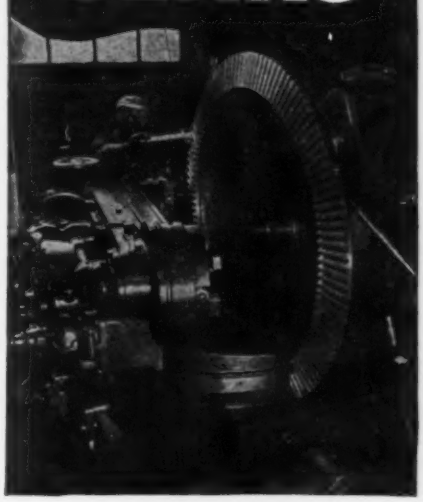
Warehouse prices on and east of Mississippi are 3¢ per lb higher. West of Mississippi, 5¢ higher.

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.

Swedish sponge iron c.l.f. New York, ocean bags	7.4¢ to 9.0¢
Canadian sponge iron, del'd, in East	10.00¢
Domestic sponge iron, 98+% Fe, carload lots	9.0¢ to 15.0¢
Electrolytic iron, annealed, 99.5+% Fe	36.0¢ to 39.5¢
Electrolytic iron unallealed, minus 325 mesh, 99+% Fe	48.5¢
Hydrogen reduced iron, minus 300 mesh, 98+% Fe	63.0¢ to 80.0¢
Carbonyl iron, size 5 to 10 micron, 98%, 99.8+% Fe	70.0¢ to $1.35
Aluminum	29.00¢
Brass, 10 ton lots	30.00¢ to 33.25¢
Copper, electrolytic	10.25¢ plus metal value
Copper, reduced	10.00¢ plus metal value
Cadmium, 100-199 lb.	95¢ plus metal value
Chromium, electrolytic, 99% min., and quantity	$3.50
Lead	6.5¢ plus metal value
Manganese	52.00¢
Molybdenum, 99%	$2.65
Nickel, unannealed	75.5¢
Nickel, annealed	81.5¢
Nickel, spherical, unannealed	78.5¢
Silicon	34.00¢
Solder powder	6.5¢ to 8.5¢ plus met. value
Stainless steel, 302	75.00¢
Tin	11.00¢ plus metal value
Tungsten, 99%	$4.15
Zinc, 10 ton lots	20.50¢ to 23.85¢

LARGE INDUSTRIAL GEARS



Bevel and mitre gears up to 60" dia. are cut on gear planers to accurate tolerances.

CUSTOM MADE GEARS

up to 145" diameter

You can save time, money and errors in your large and heavy industrial gear requirements with the prompt, custom service of SIMONDS GEAR. Within easy shipping distance of many heavy industry plants—with a personalized attention to your specific gear requirements—SIMONDS GEAR is able to assure you fast, accurate gear service for all heavier gear needs. Size range includes: Spur Gears up to 145"—Bevel and Mitre Gears up to 60"—Worm Gears up to 72"—also worms, worm gears, racks and pinions. Materials include: cast or forged steel, gray iron, bronze, silent steel, rawhide and bakelite. Place your next heavy gear inquiry with SIMONDS GEAR and test the difference!

Stock carrying distributors for Ramsey Silent Chain Drives and Couplings. V-Belts.

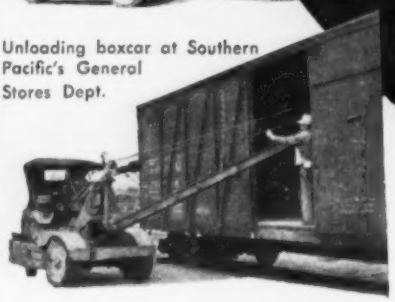
SIMONDS GEARS

THE **SIMONDS** GEAR & MFG. CO.

LIBERTY at 25th • PITTSBURGH 22, PA.

Heavy Industries Use KRANE KAR SWING-BOOM MOBILE CRANE to Cut Costs by Handling Loads Easier, Faster, Safer

Stacking fittings at a Los Angeles Public Utility



Unloading boxcar at Southern Pacific's General Stores Dept.

Handles tubes and heavy equipment at the Wilmington Refinery of the Union Oil Company

Gas or diesel, 12 to 37 ft. booms, or adjustable telescopic booms; solid or pneumatic rubber tires. 1½, 2½, 5, and 10 ton cap. Buckets, magnets, all-weather or foldable tops, and other accessories available.

WRITE FOR BULLETIN NO. 79

SILENT HOIST & CRANE CO. 851 63rd ST., BROOKLYN 20, N.Y.

"New Process"

Punches • Dies • Rivet Sets

Compression Riveter Dies

Made from high-grade alloy tool steels properly heat-treated, of uniform high quality—may be purchased with complete confidence for maximum service.

Write for Catalog 46

GEO. F. MARCHANT COMPANY

1420-34 So. ROCKWELL ST., CHICAGO 8, ILL.

ELECTRICAL SHEETS

22 Ga. H-R cut lengths

F.o.b. Mill Cents Per Lb.	Armature	Elec.	Motor	Dynamo	Transf. 72	Transf. 65	Transf. 58
Beech Botton-15	....	7.25	8.50	9.30	9.85	10.40	11.10
Brackenridge-28	....	7.25	8.50	9.30	9.85	....	....
Follansbee-63	6.75	7.25	8.50	9.30	9.85	10.40	11.10
Granite City-22	....	7.95	9.20	....	....	....	....
Ind. Harbor-3	6.75	7.25	....	....	....	....	....
Mansfield-75	6.75	7.25	8.50	9.30	....	....	....
Niles, O.-64	7.05	7.55	....	....	....	....	....
Vandergrift-1	6.75	7.25	8.50	9.30	9.85	10.40	11.10
Warren, O.-4	6.75	7.25	8.50	9.30	9.85	10.40	11.10
Zanesville-7	8.75	7.25	8.50	9.30	9.85	10.40	11.10

Transformer 52, 80¢ above Transformer 58.

Ferrochrome

Contract prices, cents per pound, contained Cr, lump size, bulk, in carloads, delivered. (65-72% Cr, 2% max. Si.)

0.06% C	30.50	0.20% C	29.50
0.10% C	30.00	0.50% C	29.25
0.15% C	29.75	1.00% C	29.00
2.00% C			28.75
65-69% Cr, 4-9% C			22.00
62-66% Cr, 4-6% C, 6-9% Si.			22.85

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 5¢ for each additional 0.25% N.

Chromium Metal

Contract prices, per lb chromium contained, packed, delivered, ton lots. 97% min. Cr, 1% max. Fe.

0.20% Max. C.	$1.09
0.50% max. C.	1.05
.00 min. C.	1.04

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-49%, C 0.05% max.) Contract price, carloads, f.o.b. Niagara Falls, freight allowed; lump 4-in. x down, bulk 2-in. x down, 21.75¢ per lb of contained Cr plus 12.00¢ per lb of contained Si.

Bulk 1-in. x down, 21.90¢ per lb contained Cr plus 12.20¢ per lb contained Si.

Calcium-Silicon

Contract price per lb of alloy, dump, delivered.

30-33% Ca, 60-65% Si, 3.00% max. Fe.

Carloads	19.00
Ton lots	22.10
Less ton lots	23.00

Calcium-Manganese—Silicon

Contract prices, cents per lb of alloy, lump, delivered.

16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads	20.00
Ton lots	22.30
Less ton lots	23.30

CMSZ

Contract price, cents per lb of alloy, delivered.

Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.

Alloy 5: 50.56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.

Ton lots	20.75
Less ton lots	22.00

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. V-5: 38-42% Cr, 17-19% Si, 8-11% Mn.

Ton lots	16.50¢
Less ton lots	17.75¢

Graphidox No. 4

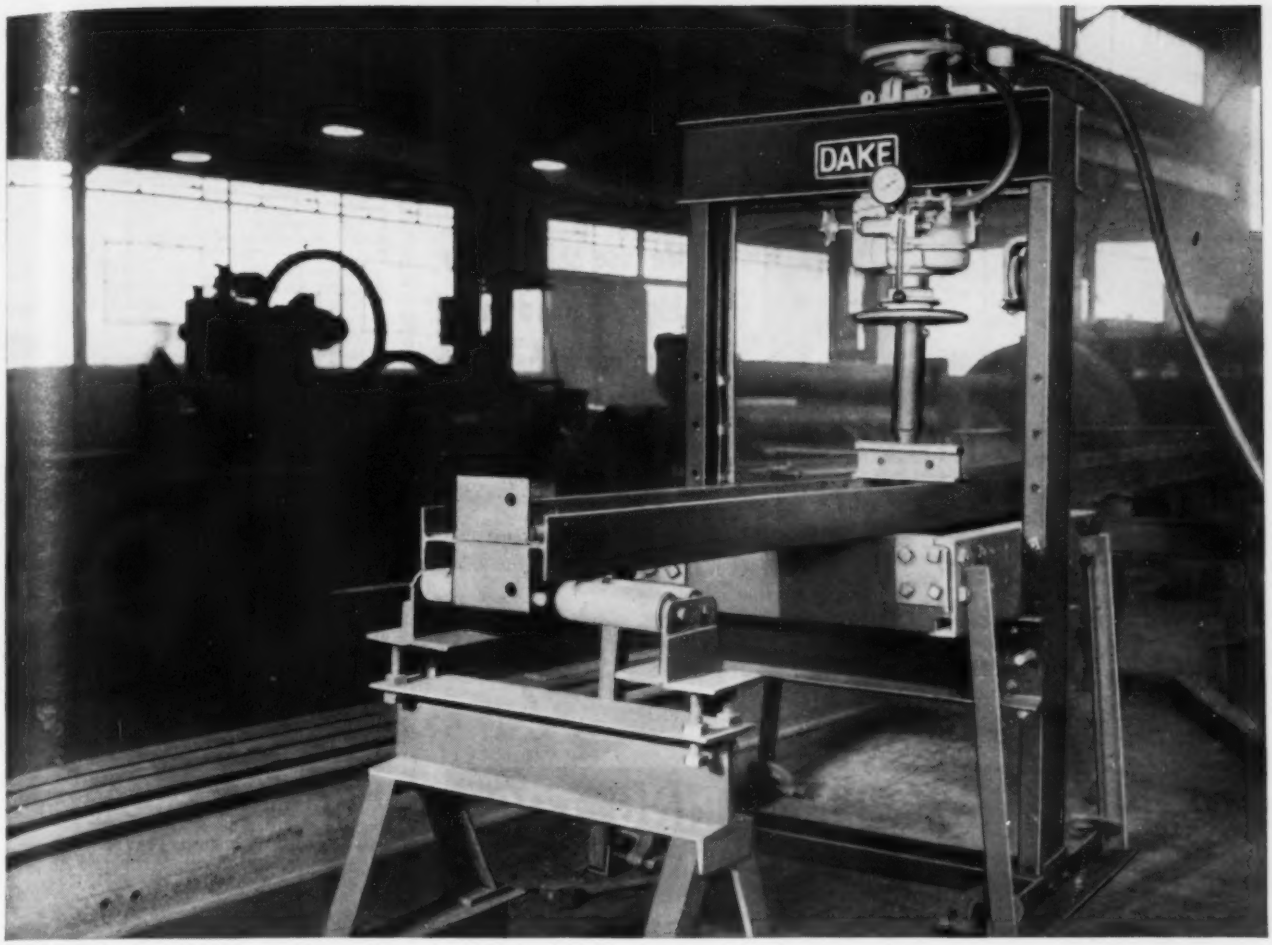
Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Carload packed	18.00¢
Ton lots to carload packed	19.00¢
Less ton lots	20.50¢

SMZ

Contract price, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe, ½ in. x 12 mesh.

Ton lots	17.25
Less ton lots	18.50



Straightening Time Cut 66%

in Steel Fabricating Plant by Using a Standard Model Dake Press

When a steel fabricating company recently sought a faster method for straightening I-beams and channels after welding, first reports indicated that a high-priced bulldozer would be required or that special equipment would have to be built for the job.

Dake engineers advised otherwise: "If you will equip our regular 50PA Air-Operated Press with a special table and screw nose," they said, "you should be able to materially reduce your straightening costs on all of your structural work." They bought the press and adapted the press to the job. (See illustration above.) The result . . . straightening time was sliced 66%; and they tell us the press paid for itself in the first two months of use.

If you have any kind of straightening, bending or pressing jobs where pressure is to be applied to metals, plastics, wood, etc., consider a regular Dake press first. If a regular model will not work satisfactorily, we will tell you so and will be glad to quote on custom-built equipment.

The complete line of regular-model Dake presses is illustrated and described in the folder which we invite you to send for . . . now.

Write for this Folder

Dake Engine Company, 602 Seventh St., Grand Haven, Michigan

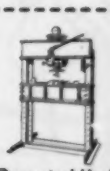
DAKE
arbor and hydraulic
PRESSES

Single Leverage

Ratchet Type

Combination

Elec-Draulic


Hand-Operated Hydraulic

It's Made Right!

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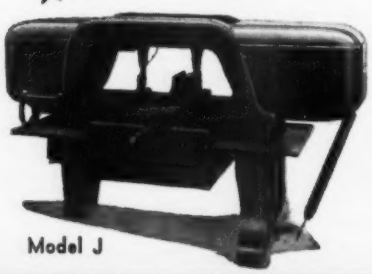

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FERROALLOYS

Ferromanganese

78-82% Mn. maximum contract base price, gross ton, lump size.

F.o.b. Niagara Falls, Alloy, W. Va., Welland, Ont., Ashtabula, O.	$185
F.o.b. Johnstown, Pa.	$187
F.o.b. Sheridan, Pa.	$185
F.o.b. Etna, Clairton, Pa.	$188

$2.00 for each 1% above 82% Mn, penalty, $2.15 for each 1% below 78%.

Briquets—Cents per pound of briquet, delivered, 66% contained Mn.

Carload, bulk	10.95
Ton lots	12.55

Spiegeleisen

Contract prices gross ton, lump, f.o.b.

	16-19% Mn 3% max. Si	19-21% Mn 3% max. Si
Palmerton, Pa.	$74.00	$75.00
Pgh. or Chicago	74.00	75.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.

96% min. Mn, 0.2% max. C, 1% max. Si, 2% max. Fe.

Carload, packed	29.75
Ton lots	31.25

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.

Carloads	28
Ton lots	30
Less ton lots	32

Medium Carbon Ferromanganese

Mn 80% to 85%, C 1.25 to 1.50. Contract price, carloads, lump, bulk, delivered, per lb. of contained Mn. 19.15¢

Low-Carbon Ferromanganese

Contract price, cents per pound Mn contained, lump size, del'd, Mn 85-90%.

	Carloads	Ton	Less
0.7% max. C, 0.06% P, 90% Mn	26.25	28.10	29.30
0.07% max. C	25.75	27.60	28.80
0.15% max. C	25.25	27.10	28.30
0.30% max. C	24.75	26.60	27.80
0.50% max. C	24.25	26.10	27.30
0.75% max. C, 7.00% max. Si	21.25	23.10	24.30

Silicomanganese

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mn, 18-20% Si, 1.5% max. C. For 2% max. C, deduct 0.2¢.

Carload bulk	9.90
Ton lots	11.55
Briquet, contract basis carlots, bulk delivered, per lb of briquet	11.15
Ton lots	11.75

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $89.50 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $83.00. Add $1.00 per ton for each additional 0.50% Si up to and including 18%. Add $1.00 for each 0.50% Mn over 1%.

Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, for ton lots packed.

96% Si, 2% Fe	21.70
97% Si, 1% Fe	22.10

Silicon Briquets

Contract price, cents per pound of briquet bulk, delivered, 40% Si, 1 lb Si briquets.

Carload, bulk	6.95
Ton lots	8.55

Electric Ferrosilicon

Contract price, cents per pound contained Si, lump, bulk, carloads, delivered.

25% Si	19.00	75% Si	14.30
50% Si	12.40	85% Si	15.55
90-95% Si			17.50

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
Less ton lots	2.40	3.30	4.55

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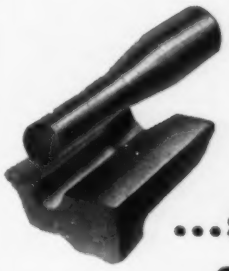
Other Ferroalloys

Alsifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.	
Carload	9.90¢
Ton lots	11.30¢
Calcium molybdate, 45-40%, f.o.b. Langeloth, Pa., per pound contained Mo.	$1.15
Ferrocolumbium, 50-60%, 2 in x D, contract basis, delivered, per pound contained Cb.	
Ton lots	$4.90
Less ton lots	4.95
Ferro - Tantalum - columbium, 20% Ta, 40% Cb, 0.30 C. Contract basis, delivered, ton lots, 2 in. x D, per lb of contained Cb plus Ta	$3.75
Ferromolybdenum, 55-75%, f.o.b. Langeloth, Pa., per pound contained Mo	$1.32
Ferrophosphorus, electrolytic, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $3 unitage, per gross ton	$65.00
10 tons to less carload	75.00
Ferrotitanium, 40%, regular grade, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti	$1.35
Ferrotitanium, 25%, low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti	$1.50
Less ton lots	$1.55
Ferrotitanium, 15 to 19%, high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton	$177.00
Ferrotungsten, standard, lump or ¼ x down, packed, per pound contained W, 5 ton lots, delivered	$3.25
Ferrovanadium, 35-55%, contract basis, delivered, per pound, contained V.	
Openhearth	$3.0-$3.05
Crucible	3.10- 3.15
High speed steel (Primos)	3.25
Molybdic oxide, briquets or cans, per lb contained Mo, f.o.b. Langeloth, Pa.	$1.14
bags, f.o.b. Washington, Pa., Langeloth, Pa.	$1.13
Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound	
Carload, bulk lump	14.50¢
Ton lots, bulk lump	15.75¢
Less ton lots, lump	16.25¢
Vanadium pentoxide, 88-92% V_2O_5 contract basis, per pound contained V_2O_5	$1.28
Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.	
ton lots	21.00¢
Zirconium, 12-15%, contract basis, lump, delivered, per lb of alloy.	
carload, bulk	7.00¢

Boron Agents

Contract prices per lb of alloy, del.	
Borosil, f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb contained B	$5.25
Bortam, f.o.b. Niagara Falls	
Ton lots, per pound	45¢
Less ton lots, per pound	50¢
Carbortam, Ti 15-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4.5-7.5%, f.o.b. Suspension Bridge, N. Y., freight allowed.	
Ton lots, per pound	10.00¢
Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D. Ton lots	$1.20
F.o.b. Wash., Pa.; 100 lb, up	
10 to 14% B	.75
14 to 19% B	1.20
19% min. B	1.50
Grainal, f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over.	
No. 1	$1.00
No. 6	68¢
No. 79	50¢
Manganese—Boron 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, delivered.	
Ton lots	$1.46
Less ton lots	1.57
Nickel—Boron 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, delivered.	
Less ton lots	$1.80
Silcas, contract basis, delivered.	
Ton lots	45.00¢

don't scrap metal by turning!



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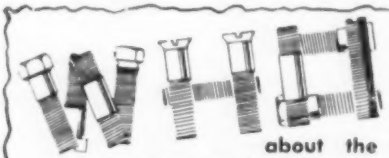

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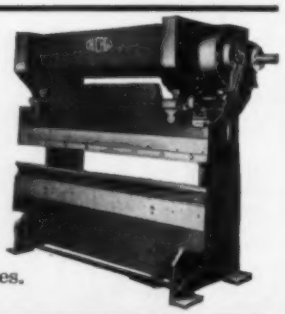

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